BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 19 1946

TEETH OF 5-YEAR-OLD LONDON SCHOOL-CHILDREN

(SECOND STUDY)

A COMPARISON BETWEEN 1929, 1943, AND 1945

BY

MAY MELLANBY

(Nutrition Building, National Institute for Medical Research, N.W.7)

AND

HELEN COUMOULOS, Ph.D.Camb., D.D.S.Athens

(Girton College, Cambridge)

Between May, 1943, and the end of January, 1944, the mouths of a large number of children aged 5 years and attending L.C.C. schools were examined and charted* and a preliminary report on this survey was made (Mellanby and Coumoulos, 1944). One of the objects of the work was to compare the condition of the deciduous teeth of these children with that of children of the same class and age group examined in 1929, when a survey on similar lines, but with a less elaborate system of charting, was made by one of us (M. M.).

In order to make the two investigations as nearly comparable as possible the same schools were chosen in 1943 as in 1929, any which were no longer available being substituted by others of similar type in the same district. The number of children examined in these schools was 1,604. In addition, examinations of 266 children were made in a few schools in districts not visited in 1929, but these were not included in the main survey as they were not truly comparable.

In the report on the 1929 survey published by the Board of Education (1931), figures were given only in relation to *children* and not to the individual types of *teeth*. For the sake of comparison, therefore, the 1943 results were given in the same form, and it was clearly shown that, as regards both structure of the teeth and caries, the general dental condition was much better than in 1929. A summary of the findings in the two surveys is given in the following quotation from the report:

> "It is clear that in the 14 years that have elapsed the picture of deciduous tooth structure has changed for the better. Even so, there are very few children with a full complement of perfectly calcified teeth; however, in 1943 18.1% had only slight M-hypoplasia compared with 7.8% in 1929, and there were fewer with much M-hypoplasia—33.3% as against 58.5% respectively. . . . 22.4% of the children in 1943 were 'caries-free,' compared with 4.7% in 1929; and only 29.3% had much caries, as against 62.8% previously."

Since very few of the children were free from caries in 1929 it was decided to include in the caries-free group any who had only one or two teeth which, according to the standards used, were probably carious to a very slight degree. Even so, as is seen from the figures quoted, only 4.7% of the 1,293 children examined came into the so-called caries-free group. (It should be noted here that the standards were much more severe than those adopted at that time in routine inspections by school dental surgeons, which are made for purposes of treatment.)

* For the sake of brevity this is referred to as the 1943 survey.

The 1943 estimate of caries-free children as 22.4%, given in the report (Mellanby and Coumoulos, 1944), was assessed on the same basis as the 1929 figure for purposes of comparison, but in arriving at the assessment a distinction was made between those in whom no caries could be diagnosed by the methods employed and those in whom there were one or two teeth showing very slight caries.

It is intended in the present paper to give the structure of, and the amount of caries in, the individual types of teeth as found in 1943 and to compare them with data obtained in an investigation made in 1945, the object of which was to ascertain whether the great improvement found in 1943 as compared with 1929 was maintained. Sample schools from each district visited in 1943 were taken for this purpose and the mouths of 691 5-year-old children were charted. The length of time that elapsed between the first of the 1943 and the last of the 1945 inspections was 26 months, and the average period between the inspections in the schools visited in both investigations was just over 20½ months.

Methods

All children of the age of 5 years (i.e., up to but not including the sixth birthday) at school on the day of the examination came under survey. This is a useful age group for the study of deciduous teeth, since few have been naturally shed and all have been subject to post-eruptive influences for a considerable period—the anterior teeth for 4 to 5½ years and the posterior for 3 to 4 years. The percentages of teeth present in the mouths at the time of inspection are shown in Table I.

TABLE I.—*Percentages of Teeth Present at Time of Inspection*

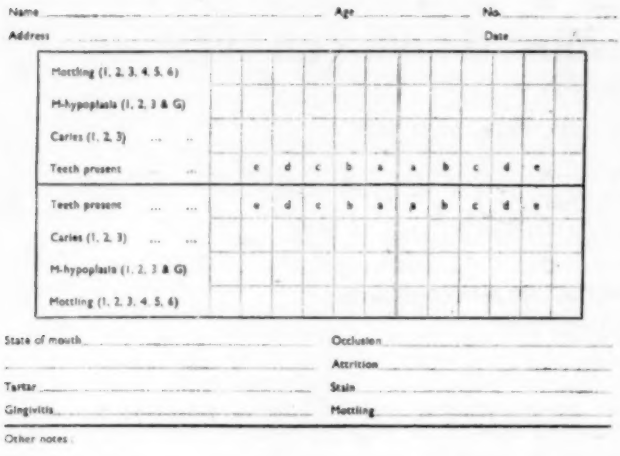
Type of Tooth	1943	1945
Upper:		
Centrals	90·7	92·6
Laterals	96·0	98·3
Canines	99·8	99·6
1st molars	90·5	95·0
2nd molars	92·4	97·5
Lower:		
Centrals	83·2	79·4
Laterals	97·9	98·0
Canines	99·9	99·9
1st molars	85·8	92·4
2nd molars	86·0	91·7
All types	92·2	94·4

In an ordinary room, with the best light available, each child was subjected to as detailed an examination of the individual

teeth as was possible by direct inspection and with a mirror and probes, in order to obtain data which could be used as a basis for comparative surveys. Special probes were used throughout (S.S. White stainless ; No. 37 for hypoplasia, No. 12 for caries), and they were renewed from time to time. *X*-ray photographs were not taken, as the technical difficulties involved were too great ; moreover, they are unnecessary in surveys of this nature, especially when made on such large numbers of children. Any caries undiagnosed by the methods used will be relatively the same in the different surveys.

By means of symbols and notes the following conditions were recorded on a simple chart designed for this work and reproduced herewith:

Chart Showing Condition of Teeth



(1) *Teeth present.*

(2) *Structure of each Deciduous Tooth.*—The standards used were evolved from the results of experiments on animals and investigations on children's teeth made by one of us (Mellanby, 1918–34). Individual teeth were taken to be of good structure when their surfaces were smooth, shiny, and white or creamy-white in colour. Variations from this standard other than gross hypoplasia are referred to as Mellanby- or M-hypoplasia, a term first used by King (1940) to distinguish these types from the gross hypoplasias (G-hypoplasia) which have long been recognized and which are not common in deciduous teeth. The M-type defects were originally described by one of us (Mellanby, 1923, 1927, 1934), who found them in over 80% of the thousands of deciduous teeth examined. Unless the teeth are dried and well illuminated, the defects are not often easily visible to the naked eye, especially when they occur in the molars, but they can be detected without much difficulty when the tooth surfaces are lightly rubbed with a probe. Degrees of roughness are not sharply defined, but merge into one another. With practice—and this must be emphasized—they can, however, be judged by the "feel" of the probe, and the teeth can be grouped under the following headings:

Hy_0: Good structure.
$M\text{-}Hy_1$: Slightly defective.
$M\text{-}Hy_2$: Defective.
$M\text{-}Hy_3$: Very defective.
G-Hy: All varieties of gross or "textbook" hypoplasia.

The incidence of mottled enamel was recorded on the charts ; but it will not be discussed here, as it is beyond the scope of this paper. Teeth showing signs of mottling were graded for M-hypoplasia and for G-hypoplasia in the same way as unmottled teeth.

(3) *Extent of Caries in Each Tooth.*—The following categories were recorded:

C_0: No caries that could be diagnosed by our methods of examination.
C_1: Slight caries—i.e., very early and suspected fissure and approximal caries.
C_2: Moderate caries; cavities involving destruction of up to roughly one-quarter of the tooth crown (including undermining caries).
C_3: Advanced caries; destruction of more than one-quarter of the tooth crown (including undermining caries). In this category were also included roots of decayed teeth and all teeth which were assumed to have been extracted for caries—i.e., all missing deciduous teeth except incisors, which were considered to have been shed naturally.

(4) *Arrest of the Carious Process.*—A carious cavity was regarded as arrested only when, by the feel of the probe, its surface was very hard, though not necessarily smooth and polished, as described in textbooks. A tooth with such a cavity was graded for caries according to the size of the arrested area and included in that grade of caries. Early stages of arrest were not recorded in these investigations.

(5) *Treatment of Carious Teeth.*—Silver nitrate applications and fillings were noted, and the cavities so treated were classified according to their size, in the same way as active or arrested caries, though some allowance was made for removal of non-carious tissue around a cavity in preparation for filling.

(6) *Staining of the Teeth.*—Records were made of the incidence, colour, extent, and contours of stains on the enamel surface or on a film adhering to it.

(7) *Other conditions,* which will not be discussed in this paper, including the state of the mouth, accumulation of food, spacing of the teeth, occlusion, attrition, and gingivitis, were also noted.

Results

Before considering the detailed results, it may be of interest to compare the findings as regards the percentages of *children* free or almost free from caries. Table II shows that in the three main surveys (those made in schools in the same districts) the improvement observed in 1943, and quoted above, was continued in 1945, and a comparison of the combined main and subsidiary surveys of 1943 with those of 1945 shows a similar improvement in the latter. The percentages of children with good dental structure also showed a progressive increase.

TABLE II—*Percentages of Caries-free Children*

Year	Total No. of Children Examined	% Caries-free	% Almost Caries-free (*See* p. 565)	Total
	Main Surveys			
1929	1,293	—	—	4·7
1943	1,604	13·4	9·0	22·4
1945	**532**	**22·2**	**4·3**	**26·5**
	Combined Main and Subsidiary Surveys			
1943	1,870	14·9	9·3	24·2
1945	**691**	**24·2**	**3·9**	**28·1**

Structure

The surface structure of the teeth examined in the two recent investigations is shown in Table III, and is expressed both as percentages and as average hypoplasia figures (AHF).* Data are given for each type of tooth and for all types taken together. The figures show that a considerable improvement in the structure of the teeth of London 5-year-old children as a whole occurred between 1943 and 1945. Whereas 30.7% of the teeth were of good structure (Hy_0) in 1943, the figure had risen to 38.0% in 1945—a statistically significant increase of $7.3 \pm 0.49\%$. There was a smaller percentage of teeth showing each grade of M-hypoplasia in 1945 than in 1943 and the AHF was lower (0.91 compared with 1.04). The improvement in structure in 1945 was marked in the incisors and canines, but the molars showed little change. In both investigations the structure of the upper incisors, especially the centrals, was much worse than that of the lower incisors. The incidence of gross hypoplasia (G-Hy) was low in both surveys as compared with M-hypoplasia, 1.9% of the teeth in 1943 and 2.3% in 1945 being so graded, whereas there were 69.3% and 62.0% respectively with M-hypoplasia.

The column headed "Hy Unclassified" includes teeth which showed types of defect which could not be graded as definitely M-hypoplastic or G-hypoplastic. In most types of teeth very few of these defects were found, but in the canines there was a somewhat higher incidence.

* See note at foot of Table III.

Caries

The incidence and extent of caries, expressed as percentages and as average caries figures (ACF),* are shown in Table IV. As in the previous table, data are given for each type of tooth and for all types taken together. The unbracketed figures in the column headed "C_3" include missing canines and molars, which were assumed to have been extracted for caries (see p. 566). The figures in brackets show these teeth as percentages of the total number (see column 2).

In Table IV it is seen that there was less caries in 1945 than in 1943. In the earlier period 69.9% of the teeth were caries-free, while in the later the figure had risen to 73.5%—a difference of 3.6±0.46%, which is significant statistically. Taking the more severe degrees of caries (C_2 and C_3) together, the percentage so graded in 1945 was slightly lower than in 1943 (20.3% compared with 22.7%), and the same trend is apparent, except in the case of the lower canines, when each type of tooth is taken separately. In both investigations the upper incisors, which were of much worse structure than the lower, were also much more carious, the upper centrals being more affected than the laterals. The average caries figures (ACF) tended to be lower in 1945 than in 1943 for all types of teeth together as well as for each individual type.

Arrest of the Carious Process

A point of much interest and, we believe, of great significance is the arrest—or, as Miller called it, the spontaneous "healing"—of the carious process, which represents a measure of the defensive reaction of a tooth to attack by caries. It was shown in investigations in Sheffield (Mellanby, Pattison, and Proud, 1924; Mellanby and Pattison, 1926, 1928) and Birmingham (Dental Disease Committee, Medical Research Council, 1936) that in controlled dietetic investigations on children a striking feature in the groups having a good calcifying diet rich in vitamin D was the relatively high proportion of teeth in which the carious process was no longer active but had become or was becoming arrested. Many of the children concerned in the Sheffield investigations were under observation for a period of several years, and it was found possible in some cases to trace the gradual arresting of the carious process until the final hard, smooth, and polished state was reached. When a tooth showing this "healing" or arrest was sectioned after being shed or extracted it was usually found to contain a large amount of well-calcified secondary dentine. On the basis of animal experiments (Mellanby, 1923, 1930) it seemed feasible to conclude that the deposition of this secondary dentine was related to the arrest of caries and to the type of diet eaten at and after the time of the carious attack.

In the surveys here described arrest was recorded only when the carious area had become definitely hard, though not necessarily smooth and polished. It is interesting to note in Table V that in 1943 11.7% of the carious teeth present in the mouths of the children examined showed arrest and that in 1945 the percentage was almost doubled—i.e., 21.5%. Had teeth showing earlier stages of arrest been included the figures for both surveys would undoubtedly have been much higher.

TABLE III—*Comparison of Tooth Structure in 1943 and 1945*

Type of Tooth	Total No. of Teeth Examined for Structure		Good: Hy_0		M-Hy_1		M-Hy_2		Very Defective: M-Hy_3		G–Hy (*See* p. 566)		Hy Unclassified		AHF*	
	1943	1945	1943	1945	1943	1945	1943	1945	1943	1945	1943	1945	1943	1945	1943	1945
Upper:			%		%		%		%		%		%			
Centrals ..	3,324	1,282	18·2	25·0	33·9	36·2	34·3	28·1	9·4	6·0	3·9	6·6	0·2	0·2	1·37	1·14
Laterals ..	3,465	1,341	27·2	38·6	46·9	39·4	19·0	14·3	4·1	2·2	2·5	5·4	0·3	0·1	1·00	0·79
Canines ..	3,707	1,369	32·5	40·8	50·8	45·7	13·2	10·1	1·5	1·1	1·0	1·1	1·0	1·2	0·83	0·71
1st molars ..	3,268	1,282	8·2	8·7	32·1	39·2	49·9	42·9	7·0	6·4	2·8	2·8	0·0	0·0	1·57	1·48
2nd molars	3,427	1,342	6·0	5·2	29·2	39·5	54·0	45·7	9·4	8·6	1·3	1·0	0·1	0·0	1·68	1·58
Lower:																
Centrals ..	3,091	1,097	71·7	85·1	24·2	14·0	3·2	0·4	0·6	0·0	0·2	0·5	0·03	0·0	0·33	0·15
Laterals ..	3,624	1,348	61·5	79·5	33·7	19·2	4·2	0·8	0·4	0·0	0·1	0·3	0·1	0·1	0·43	0·21
Canines ..	3,702	1,370	51·9	69·7	36·9	23·5	5·9	2·3	0·5	0·1	1·4	0·7	3·4	3·8	0·53	0·30
1st molars ..	3,119	1,235	18·4	22·3	38·5	39·6	36·5	32·5	4·0	3·1	2·5	2·6	0·1	0·0	1·27	1·17
2nd molars	3,104	1,241	7·5	7·5	34·1	37·5	48·6	45·4	6·3	5·1	3·4	1·5	0·1	0·0	1·56	1·55
Totals ..	33,831	12,887	30·7	38·0	36·3	33·6	26·3	22·0	4·2	3·5	1·9	2·3	0·6	0·6	1·04	0·91

* AHF (average hypoplasia figure) = $\frac{\text{Total hypoplasia figure}}{\text{Total number of teeth examined for structure (excluding those with G—or unclassified hypoplasia)}}$

TABLE IV.—*Comparison of Caries Incidence and Extent in 1943 and 1945*

Type of Tooth	Total No. of Teeth		C_0		C_1		C_2		C_3		Total Carious Teeth		ACF*	
	1943	1945	1943	1945	1943	1945	1943	1945	1943	1945	1943	1945	1943	1945
Upper:			%		%		%		%		%			
Centrals ..	3,392	1,280	62·4	70·5	9·8	5·0	16·2	17·2	11·6	7·3	37·6	29·5	0·77	0·61
Laterals ..	3,590	1,358	79·7	85·1	6·8	3·2	9·2	8·6	4·3	3·1	20·3	14·9	0·38	0·30
Canines ..	3,740	1,381	90·5	92·5	2·9	1·7	4·6	4·2	2·0 (0·2†)	1·6 (0·4†)	9·5	7·5	0·18	0·15
1st molars ..	3,740	1,382	58·0	61·1	8·7	8·3	13·3	17·4	20·0 (9·5†)	13·2 (5·0†)	42·0	38·9	0·95	0·83
2nd molars ..	3,740	1,382	43·5	48·6	17·2	17·7	18·1	23·6	21·1 (7·6†)	10·1 (2·5†)	56·5	51·4	1·17	0·95
Lower:														
Centrals ..	3,112	1,098	95·1	98·3	2·7	0·9	1·5	0·8	0·7	0·0	4·9	1·7	0·08	0·03
Laterals ..	3,662	1,354	96·3	97·9	2·0	0·6	1·3	1·3	0·4	0·2	3·7	2·1	0·06	0·04
Canines ..	3,740	1,382	93·1	94·1	2·4	0·7	3·3	4·3	1·2 (0·1†)	0·9 (0·1†)	6·9	5·9	0·13	0·12
1st molars ..	3,740	1,382	46·0	51·4	7·9	7·2	17·0	21·1	29·1 (14·2†)	20·3 (7·6†)	54·0	48·6	1·29	1·10
2nd molars ..	3,740	1,382	39·0	41·2	12·9	15·1	15·0	19·5	33·1 (14·0†)	24·1 (8·3†)	61·0	58·8	1·42	1·27
Totals ..	36,196	13,381	69·9	73·5	7·4	6·2	10·1	12·0	12·6 (4·7†)	8·3 (2·5†)	30·1	26·5	0·65	0·55

*ACF (average caries figure) = $\frac{\text{Total caries figure}}{\text{Total no. of teeth (including extractions)}}$ † See above.

TABLE V.—*Teeth Showing Arrest (Spontaneous "Healing") of the Carious Process*

	No. of Carious Teeth Present	% Carious Teeth Present Showing Arrest
1943	9,182	11·7
1945	3,203	21·5

* See note at foot of Table IV.

Treatment of Carious Teeth

In Table VI are shown the percentages of carious teeth assumed to have been extracted (that is to say, the missing canines and molars) and the percentages which had been treated by silver nitrate application or had been filled. It will be seen that there was less treatment of all kinds in 1945 than in 1943. This may, of course, be because there were fewer dental surgeons to cope with the work.

TABLE VI.—*Carious Teeth Extracted, Treated by Silver Nitrate, or Filled*

	Total No. of Carious Teeth (Including Extractions)	Treatment			Total Percentage of Carious Teeth Treated
		% Extracted	% Silver Nitrate	% Filled	
1943	10,886	15·7	6·7	2·7	25·0
1945	**3,545**	**9·6**	**2·8**	**2·4**	**14·8**

Relationship between Structure of Teeth and their Susceptibility to Caries

Attention has been drawn by one of us (M. M.) and by others using the same criteria (Davies, 1939; Dental Disease Committee, 1936; King, 1940) to the fact that there is a direct relationship between the structure of the deciduous teeth, according to the standards used, and their susceptibility to caries: the less the M-hypoplasia the less, in general, the caries. In the investigations described in this paper the same relationship is evident, as is seen from Table VII.

TABLE VII.—*Percentage Incidence of Caries in Teeth with Varying Grades of Structure*

Grade of Structure	Incisors				Canines				Molars			
	Total No. Examined		% Carious		Total No. Examined		% Carious		Total No. Examined		% Carious	
	1943	**1945**	1943	**1945**	1943	**1945**	1943	**1945**	1943	**1945**	1943	**1945**
Hy_0	5,992	**2,837**	1·1	**1·2**	3,126	**1,514**	1·5	**1·1**	1,281	**550**	8·3	**7·0**
$M\text{-}Hy_1$	4,724	**1,399**	12·0	**11·2**	3,248	**947**	7·9	**8·0**	4,310	**1,987**	24·5	**25·0**
$M\text{-}Hy_2$	2,053	**536**	44·9	**39·2**	707	**159**	26·7	**29·6**	6,133	**2,127**	62·6	**66·5**
$M\text{-}Hy_3$	487	**105**	80·4	**81·0**	75	**16**	61·1	**68·9**	867	**335**	87·1	**92·3**
G-Hy	226	**165**	64·2	**62·4**	90	**24**	23·3	**20·8**	319	**101**	58·9	**52·5**

NOTE.—This table does not include the few teeth shown under the heading "Hy Unclassified" in Table III.

When the teeth were of good structure (Hy_0) only 1.1% of the incisors, 1.5% of the canines, and 8.3% of the molars were carious in 1943, and the corresponding figures for 1945 were 1.2%, 1.1%, and 7.0%. With each degree of M-hypoplasia the percentage of carious teeth increased in both surveys, until with very hypoplastic structure ($M\text{-}Hy_3$) there were in 1943 80.4% of incisors, 61.1% of canines, and 87.1% of molars carious, and in 1945 81.0% of incisors, 68.9% of canines, and 92.3% of molars.

The incidence of caries in teeth with gross hypoplasia was not as great as in those with severe M-hypoplasia. This is understandable because, although the enamel of part of a tooth may be badly pitted, or even missing, the remaining enamel, laid down at a different period of growth, may be quite well formed. For this reason it was decided, in tabulating the relationship between structure and caries, not to combine teeth showing gross hypoplasia with those affected by severe M-hypoplasia, as was done in some earlier surveys (Mellanby, 1934).

TABLE VIII.—*Amount of Caries in Relation to Superficial Staining of Teeth*

Children with	Percentage of Carious Teeth		ACF	
	1943	**1945**	1943	**1945**
(*a*) No stain	30·1	**23·1**	0·66	**0·48**
(*b*) Black and dark-brown stains ..	19·3	**15·4**	0·41	**0·30**
(*c*) Green stain	33·4	**33·0**	0·72	**0·69**

Staining of Surface Enamel or of Films on the Enamel

Very little appears to be known about the superficial staining seen on the teeth of many children. It is often unsightly and difficult to remove by ordinary brushing, and, if removed, usually returns. In the surveys here recorded the most common stains observed were black, very dark brown, or green. The black and dark brown usually took the form of a border to what appeared to be a film on the tooth, though it might be more widespread, and the green often seemed to extend from the gingival margin towards the incisal edge or cusps.

The percentages of children whose teeth were all free from stain were 51.6 in 1943 and 35.5 in 1945. With black and dark brown stains on some or all of their teeth there were 10.6% and 11.3% and with green stains 34.9% and 46.5% respectively. The teeth of a few children had yellow or lightish-brown stains or a combination of two or more stains, but figures will not be given for them here, as there were too few in any group to be of significance.

It was noticed that many of the children whose teeth showed the black and dark-brown stains were caries-free, and an attempt was made to discover whether the stains were definitely associated with the incidence of caries. Table VIII indicates that in each survey the percentage of carious teeth and the ACF of children with black and dark-brown stains were lower, and with green stains somewhat higher, than those of the children with no stain. It thus seems from these figures that black and dark-brown stains are associated with a lower incidence of dental caries, whereas green stains may be associated with a higher incidence, but we have no knowledge as to the reason for these apparent associations.

Discussion

An account is given of two investigations on the condition of the deciduous teeth of 5-year-old children attending L.C.C. schools in 1943 and 1945, and a comparison is made between these investigations and one of a similar nature made by one of us (M. M.) in 1929. Since, however, no data are now available in regard to the state of the individual teeth in 1929, the comparison is confined to the general dental condition. In 1943 this was much better as regards both structure and caries than in 1929, and in 1945 it was still further improved.

Though the 1943 and 1945 investigations were not controlled in the way that animal experiments can be regulated, the groups of children examined were comparable in that they were of the same age group and social class and resided in the same districts of the L.C.C. area. From the dietary point of view there was a degree of similarity during the war years, because the rationing and "points" system of food distribution gave equal purchasing opportunities to all families. The main point of dissimilarity, so far as could be seen, was that the 1945 group of children had been subjected for a longer period to the war dietary than the 1943 group—a fact to which attention must be drawn.

Data obtained from the classification of individual teeth emphasized the better dental condition of the children seen in 1945 as compared with 1943. For instance, the percentage of teeth of good structure (Hy_0) rose from 30.7 in 1943 to 38.0 in 1945, and of caries-free teeth (C_0) from 69.9 to 73.5—a statistically significant difference in each case—and the percentages of teeth with the more severe defects of structure ($M\text{-}Hy_3$) and more advanced caries (C_3) decreased appreciably in the intervening period. The amount of arrest or spontaneous "healing" of the carious process was almost twice as great

in 1945 as in 1943—an indication that some powerful post-eruptive influence had been at work.

If, as seems certain, this improvement in dental condition is not accidental, but is related to some factor or factors of diet or environment to which the children were subjected, an examination of possible factors may bring to light those responsible for the facts observed.

It is claimed by some that carbohydrates play a prominent part in the initiation of caries. Others say that poor dental hygiene is responsible, and yet others that heredity is an important factor. So far as our knowledge goes, however, there is no sound scientific evidence for any of these contentions. To test the carbohydrate theory, King (1946) investigated the effects of nightly supplements of boiled sweets and chocolate-coated biscuits on the deciduous teeth of a small number of infants living in two institutions. The supplements were given when the children had cleaned their teeth just before going to bed. There was no increase in carious activity in the children over periods of from 6 to 24 months, and at the end of the test previously active caries had become arrested. It must be stated that the children had a good calcifying diet containing cod-liver oil. This result does not support the view that carbohydrates are responsible for the disease. The two recent surveys on L.C.C. school-children also do not uphold the theory. Less active caries and a greater proportion of teeth showing arrest of the disease were seen in 1945 than in 1943, but there is no evidence that the consumption of carbohydrates among young children had diminished in the intervening period.

It cannot be argued, either, that the reduction of caries in 1945 as compared with 1943 was in any way related to better dental hygiene, since as the war progressed civilian dentists became fewer and toothbrushes were more difficult to obtain (Magee, 1946).

If heredity were the potent factor in caries that it is sometimes claimed to be we should not see the deterioration in the dental condition of native races that is so evident when they come in close contact with Western peoples. An outstanding example of this is seen in the American negroes who have become completely Westernized in their habits and dietary. It is well known, too, that both children and adults of the primitive races in Africa who adopt the Western mode of life and diet—those, for instance, living for long periods in the ports and industrial areas—lose that freedom from caries which is so common while they remain in their natural habitat, and the same deterioration is seen in Eskimos attached to trading stations. It would seem, therefore, that some other cause for the observed improvement in dental condition in 1945 as compared with 1943 must be sought.

Previous investigations on children by one of us (M. M.) and by colleagues using the same standards (Deverall, Dental Disease Committee, 1936; Davies, 1939; King, 1940) have shown that resistance to caries is related to dental structure *as diagnosed in these surveys*—that is to say, the better the structure the less the liability to decay. Unfortunately this relationship is not always appreciated by dental surgeons, many of whom recognize only the more gross forms of hypoplasia. It has also been shown that the chief factors required for the production of well-formed teeth include a sufficiency of calcium, phosphorus, and vitamins D and A, and that these same factors in the diet after eruption of the teeth tend to retard the onset of caries and to arrest the disease when present. If vitamin D and calcium supplies are deficient other food factors come into prominence. Certain constituents of cereals, for instance, may under these circumstances be harmful from the point of view of the teeth.

During the early stages of dental development mother and child must be considered as one unit. The pregnant and lactating woman must herself then be made as dentally fit as possible to avoid absorption of toxins and to enable her to masticate her food, and her diet must be such that the developing foetus, and later the infant, is supplied with the food factors necessary for the production of well-formed teeth. After weaning, the child itself must continue to receive a calcifying diet.

There is no doubt that in this country the diet of the majority of people, and especially of the children, is far better to-day in this respect than it was, say, 25 years ago. During recent years, and particularly during the immediate pre-war and the war years, pregnant and nursing women, infants, and children have been encouraged (*a*) to consume more milk and eggs and so to obtain larger supplies of calcium and phosphorus, as well as of vitamins D and A; (*b*) to take vitamin D- and vitamin A-containing substances, either as cod-liver oil or as one of the proprietary products; and (*c*) to eat more potatoes. Moreover, for a number of years now vitamins D and A have been added to some brands of margarine, and since the early days of the war this has been made compulsory for all brands. Again, calcium was added to some flours before the war, and since 1943 the addition has been a routine measure.

It seems probable that the improvement in dental condition of 5-year-old children during recent years is directly related to the enrichment of their diet in these respects. The children examined in 1943 showed a considerable improvement on the 1929 group, and, as has been indicated in the tables in this paper, the 1945 group, who had received calcifying supplements for longer periods than their predecessors in 1943, showed an even greater improvement. Not only were their teeth better formed and less carious, but a greater percentage that had been attacked by caries had set up a resistance, as a result of which the carious process had been arrested. The advantage of this natural "healing" of carious cavities over treatment by filling or extraction is obvious. Evidence is accumulated to show that in some other countries, among them Norway and Sweden, there has been a progressive decrease in caries incidence during the past few years and that it could be attributed to the increased consumption of cod-liver oil, calcium, and vitamin preparations. It is of interest to learn, in view of the controversy on the effect of carbohydrates on the teeth, that in Sweden the amount of chocolate and sugar consumed is high and continued so throughout the war.

Taking all known facts into consideration, therefore, it would seem that nutritional factors offer the most likely solution to the problem of tooth structure and freedom from caries, and it appears to us that the incidence of the disease could be still further reduced by giving diets rich in calcifying properties to everyone, but especially to all pregnant and nursing women and to infants.

It must be borne in mind, however, that in spite of the improvement in dental condition described here, we in this country have not yet gone very far along the road to perfection. There are even to-day over 70% of L.C.C. school-children between the ages of 5 and 6 years who have some decayed deciduous teeth, and there are other parts of the country where the situation is worse. It is evident, therefore, that we still have a long way to go before we can guarantee that a child will grow up without dental decay.

Summary

The dental condition of comparable groups of 5-year-old children attending L.C.C. schools in 1943 and 1945 respectively is described and discussed, and is compared with that found in 1929.

The general dental health of the children examined in 1943 was much better than that of the 1929 group, and in 1945 there was a further appreciable improvement.

The individual teeth in 1945 were significantly better in structure and had less caries than those in 1943.

A point of special significance is that the percentage of carious teeth showing arrest of the disease was almost twice as large in 1945 as in 1943. The percentage of such teeth extracted, treated by silver nitrate, or filled was considerably smaller in the second survey than in the first.

Superficial black or brown stains, which were observed on many teeth, appeared in both surveys to be associated with a lower incidence of caries, and green stains with a somewhat higher incidence, than the absence of stain.

There was in both surveys a relationship between M-hypoplasia and caries, the more severe the degree of structural defect the higher being the incidence of the disease. Teeth with gross hypoplasia showed a medium amount of caries.

It is suggested that the better condition of the teeth of 5-year-old children in 1943 and 1945 as compared with 1929 was due to the increased calcifying properties of the dietary of this country, and particularly of pregnant women, infants, and young children during recent years, and that the improvement observed in 1945 as compared with 1943 was due in the main to the longer period the teeth examined had been influenced by the type of diet made available immediately before and during the war years.

Acknowledgments

Our thanks are extended to many who have helped us directly or indirectly with the investigations and the preparation of this report. We are especially grateful to Mrs. M. Kelley and Miss I. Allen for their assistance with analysis of the results, the compilation of the tables, and the arrangement of the text; also to Dr. W. J. Martin, of the Medical Research Council, for the statistical assessment of some of the figures. Others we would particularly like to mention are the London County Council and Sir W. Allen Daley for their permission to carry out the inspections and for making arrangements for us to visit the schools; the care-committee workers; the medical officers of health and others in the districts we visited who kindly supplied us with much invaluable information; and the head teachers and their assistants, especially those who so willingly allowed us to pay them a second visit.

H. C. held a scholarship from the British Council, and the expenses of the investigations were paid by the Medical Research Council. To both of these bodies we are grateful.

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A CASE OF ADDISON'S DISEASE SUCCESSFULLY TREATED BY A GRAFT

BY

L. R. BROSTER, O.B.E., F.R.C.S.
Surgeon to Charing Cross Hospital

AND

H. GARDINER-HILL, M.B.E., M.D., F.R.C.P.
Physician to St. Thomas's Hospital

This is the story of a young woman in whom, nine months previous to our seeing her, a diagnosis of Addison's disease had been made on clinical and biochemical findings. The diagnosis was confirmed at the time of our examination, and one of us (L. R. B.) subsequently ingrafted an adrenal gland from a patient with the adreno-genital syndrome (hyperplasia). As a result of this operation our patient lost her symptoms and signs of Addison's disease, and sodium chloride withdrawal tests showed that her blood sodium no longer fell below normal. The last test (14 months after operation) showed that this change had been maintained; and she was now able to leave off substitution therapy with sodium chloride without relapse.

Case History

Miss W., aged 33 (Jan., 1945), had not been well for six years, the onset of her illness coinciding with the outbreak of war in 1939. There were four groups of symptoms: (1) Depression and nervous symptoms which had been present since the start. For a time she had thought that these were due to the war. (2) Gastro-intestinal symptoms: during the whole period of her illness she had suffered on and off from what she described as a "nervy tummy." She felt that it was on the move all the time and complained of attacks of diarrhoea lasting for two or three days which alternated with bouts of constipation. No evidence of organic disease had been found by Dr. Wetherell, and it would appear that these attacks did represent an irritable gastro-intestinal neuro-muscular mechanism. In April, 1944, an *x*-ray examination was carried out, but the only abnormality was a spastic descending colon. In May, 1944, she was sent to Sir Arthur Hurst. He discovered that she had achlorhydria, and as a result of the acid therapy which he instituted the attacks of diarrhoea practically disappeared. (3) Extreme lassitude had been noticeable from 1943 onwards, but it had been difficult to assess the relative significance of psychological and physical factors. Dr. Wetherell, in April, 1943, found her blood pressure to be 110/76, and the same level was found by Sir Arthur Hurst at his examination at about this time. It was then that Addison's disease was first suspected by Dr. Wetherell and Sir Arthur Hurst. (4) Pigmentation: a smoky brown pigmentation was first commented on by Dr. Wetherell and Sir Arthur Hurst in April, 1944, and it had become more pronounced by the time we saw her in January, 1945.

In April, 1944, she was under Sir Arthur Hurst's care in Oxford, and he notified Dr. Wetherell that he agreed with his opinion and that the probable diagnosis was Addison's disease. Increased pigmentation and general asthenia troubled her most; and a low systolic blood pressure, 110, was the chief physical sign. Her blood sodium at this time was 310 mg. per 100 ml. (the normal level being 320). Sir Arthur Hurst commented that no fall in blood chloride or rise in blood potassium was found, but that neither was a constant feature in early cases. He advised extra salt to the extent of four teaspoonfuls daily, and the patient commented on an immediate improvement, saying that she felt stronger and fitter. Sir Arthur Hurst felt that this might have been due only to suggestion, but the improvement was so marked that he thought it was the direct result of the increased sodium chloride intake and further evidence in favour of Addison's disease. He advised continuation of this treatment.

In October, 1944, the blood sodium level was 284 mg. per 100 ml. The patient was supposed to be on full substitution therapy with sodium chloride, but Dr. Wetherell thought that her ingestion of sodium-chloride had been distinctly "sporadic." He subsequently made arrangements for her to see Mr. Broster, and she came into University College Hospital private wing under our care in January, 1945.

Other investigations had been carried out. Her blood count on two occasions was normal. No occult blood had been found in her stools, which contained no excess of fatty residue, no inflammatory material, and no pathogenic bacteria. No tubercle bacilli were found. A test-meal showed complete achlorhydria. Her weight in adult life was normally 8 st. (50.1 kg.), and it remained at 8 st. until the spring of 1944. She then lost weight to 7 st. 4 lb. (46 kg.), and has remained at that since. Her menstrual cycle has been regular throughout —5/28-day type.

On examination in January, 1945, when she came under our observation, she had been under treatment with sodium chloride, four teaspoonfuls daily, and injections of cortical hormone, but there was still considerable pigmentation of her entire body. There was a smoky brown discoloration of the nipples and in the axillae, and patches of pigmentation on her buccal mucous membrane. Blood pressure at that time was 120/80. There were no abnormal physical signs in her cardiovascular system. Chest and abdomen were normal, as were her secondary sex characters. She was normally developed. Her weight was 7 st. 4 lb. A radiological examination of the abdomen showed a hazy area of calcification over the upper pole of the left kidney which was interpreted by the radiologist as indicating calcification in the adrenal gland on that side. The Mantoux test was negative.

During the first week of her stay in hospital her temperature chart showed a slight and irregular pyrexia up to 99.6° F. (37.55° C.), but it never reached 100° (37.8° C.). Subsequently her temperature was normal except for a slight recrudescence of fever for a few days after operation.

To establish the diagnosis of Addison's disease her substitution therapy of salt and cortical hormone was discontinued for a week. At the end of that time her pigmentation and asthenia had definitely increased. Her blood pressure fell at the end of a week off treatment to 95/80. Serum sodium at this time was 295 mg. per 100 ml., and serum potassium 21 mg. per 100 ml. We considered that these findings established the diagnosis of hypocortical adrenalism.

After this sodium withdrawal test she was put back on sodium chloride treatment, and a week later the grafting operation was carried out by L. R. B.

Description of the Donor

Miss H., aged 21, a robust young lady, was first seen in 1942. Her history was that at the age of 16 she began to

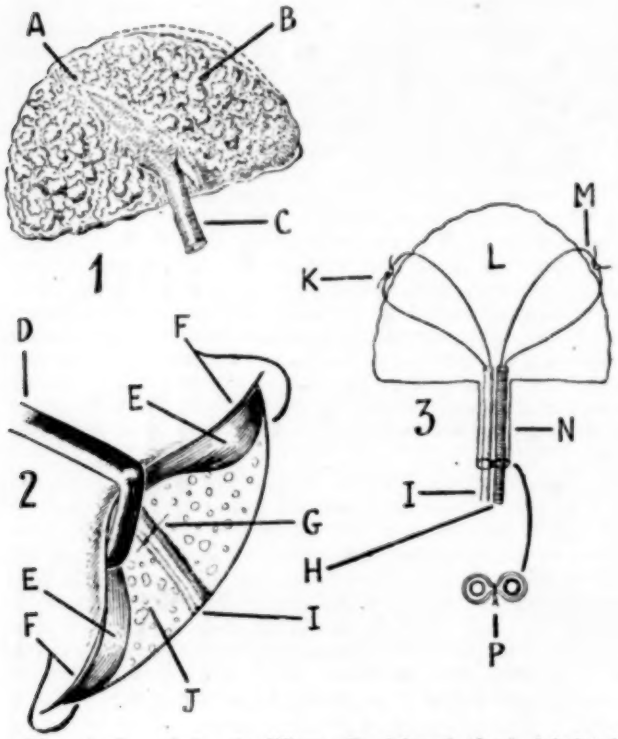
develop hirsuties, but except for a bout of amenorrhoea for three months her periods had been normal. Her ketosteroid excretion was 15 mg. a day, and she was treated medically for adrenal virilism, Group II.

She then joined the A.T.S. and became a P.T. instructress. The hirsuties became worse, and she shaved daily; there was amenorrhoea for three months; she broke off her engagement. She reported again at the end of 1944 and her ketosteroid excretion was now 29.5 mg. a day. During her stay in hospital in February, 1945, she was mildly hallucinated, depressed, and uncooperative, and although a month after the operation described below her ketosteroid excretion dropped to 5 mg. a day, contrary to our previous experience her mental condition deteriorated considerably and remained so longer than usual. The details of her psychosis were observed by Dr. Clifford Allen.

Operative Procedures

Donor.—On Feb. 13, 1945, the left adrenal gland was removed at the Charing Cross Hospital. It was an ideal one—hypertrophied to two to three times the normal size. Its vein, unbranched and large, was cut long so as to leave about 1/2 in. (1.27 cm.) attached to the gland. The vein was perfused with heparin solution, and the graft placed in normal saline in a sterile glass container. This was then put into a second sterile glass container and transferred to a vacuum flask at body heat.

Recipient.—The recipient was prepared in the private wing of University College Hospital. An incision was made along the outer border of the left rectus muscle, the rectus retracted inwards, and 1 in. (2.54 cm.) of the deep epigastric artery and vein was exposed and cut medially. Arterial bleeding was



Figs. 1, 2, and 3. A=Hilum; B=Adrenal gland, lobulated; C=Main adrenal vein; D=Retractor; E=Rectus muscle; F=Rectus sheath; G=Divided here; H=Deep epigastric artery; I=Deep epigastric vein; J=Extraperitoneal fat; K=Ligature, with knot pulling up vein; L=Adrenal gland; M=Ligature, with knot pulling up artery; N=Adrenal vein, containing artery and vein; P=Stitch separating artery and vein.

controlled by finger pressure, and the wound was bathed in heparin solution. The artery and vein were each caught up laterally by a stitch of the finest catgut threaded on two straight needles. By this time bleeding had ceased. The artery and then the vein were separately piloted into the adrenal vein by pushing the two needles up the latter and causing them to emerge at separate points on the surface of the gland. The vessels were anchored in position by tying the stitch across the intervening cortex. To prevent any backflow of blood a stitch was tied across the open end of the adrenal vein, dividing the epigastric artery and vein into two separate compartments (see Figs. 2 and 3). The graft lay snugly in the extraperitoneal fat when placed behind the rectus muscle. Including the journey by car, the whole operation took about three-quarters of an hour. The wound healed by first intention.

Convalescence

On the second day after the operation the recipient menstruated unexpectedly for three days—twenty-four hours before the donor, who started again normally after three months' amenorrhoea. The recipient now took her rhythm from the donor, and the next period came on March 18, 1945, and lasted five days. The day before this period, "she felt the graft enlarged and never felt so well." The day after, she experienced soreness and burning in the left abdomen, and developed a haematoma which subsided normally. It was obvious that the vascular anastomosis of the graft had leaked and could not cope with the extra flow of blood induced by the general pelvic congestion.

It was feared that this unforeseen occurrence due to a normal physiological function had jeopardized the vitality of the graft. However, during subsequent examinations the graft, though smaller, was palpable and tender, more so just before and during a period, and on deep pressure pain was referred towards the left subcostal margin.

She continued on salt treatment during her convalescence, and three weeks after the operation she was discharged from hospital: blood pressure 115/85; serum sodium 333 mg. per 100 ml.; serum potassium 21 mg. per 100 ml. Her pigmentation had definitely decreased. As she was on substitution therapy it was obviously not possible to assess the effects of the graft, and in view of her psychological state we did not think it advisable to perform a sodium withdrawal test at this time. It was agreed that she should return to hospital for this to be carried out.

She returned to her home but had to be readmitted to hospital three and a half weeks later for the above haematoma, which quietly subsided. Her serum sodium at this time was 300 mg. per 100 ml.; serum potassium 33 mg. per 100 ml.

Sodium Withdrawal Tests

(1) Sodium withdrawal test three months after operation.—On admission her general health had improved, but the report from her home was that she had not been doing anything at all and had only been up for an hour or two a day. She had continued on sodium chloride, four teaspoonfuls daily, and it seemed to be her psychological state which prevented her from doing more. She appeared to have a considerable anxiety state, which perhaps was not surprising after her long illness.

On examination, her pigmentation was much less evident; blood pressure 115/75; serum sodium 325 mg. per 100 ml.; serum potassium 23 mg. per 100 ml.

She was left off salt treatment for seven days without any deterioration in her general condition. At the end of seven days her blood pressure was found to be at about the same level—112/70; serum sodium was 340 mg. per 100 ml.; serum potassium 21 mg. per 100 ml. This was obviously a great improvement as compared with the sodium withdrawal test before operation.

It was decided that she should return home and continue with sodium chloride, four teaspoonfuls daily, and get up and about and lead as normal a life as she could.

(2) Second test, nine months after operation (November, 1945).—Her general condition, mental and physical, had much improved. In fact, we noted a particularly striking psychological improvement. Her general pigmentation was very slight, and there was no pigmentation on her buccal mucous membrane. Her blood pressure on admission was 130/95; serum sodium 310 mg. per 100 ml.

Sodium chloride treatment was left off for eight days, and at the end of that time her blood pressure was 120/95. Her serum sodium had risen to 365 mg. per 100 ml. This reading was doubted, so a second serum sodium examination was carried out a few days later to confirm, and a level of 340 mg. per 100 ml. was found. It should be mentioned that a menstrual period coincided with this test, the losses starting two days after salt had been withdrawn.

She was again sent home to lead as normal a life as possible, and this time it was clear that she had developed more confidence.

(3) The third test, thirteen months after operation (February, 1946).—There was a striking improvement in her general physical and mental condition. She was still emotionally unstable, as was shown not only by her subjective complaints but also by the wide variations in the blood pressure readings found on admission. There were pronounced peaks, but the average was 145/80. Her serum sodium on admission was 335 mg. per 100 ml.; serum potassium 20.5 mg. per 100 ml.

This sodium withdrawal test was carried out over seven days, and at the end of this time there was no deterioration in her general condition; blood pressure readings averaged 155/100. Her serum sodium was 330 mg. per 100 ml., her serum potassium 20 mg. per 100 ml. At the end of the test the sodium chloride treatment was restarted and continued for seven days, after which serum sodium was 336 mg. per 100 ml.; serum potassium 23 mg. per 100 ml.

It was then decided that she should leave off substitution therapy with sodium chloride altogether and return to a normal diet. This she did for the remainder of her stay in hospital—nineteen days—and at the end of that time her average blood pressure readings were 155/110, with even more pronounced emotional reaction peaks. In fact, on one occasion a systolic pressure of 180 was registered while she was complaining of sensations of what she described as "whizziness." Serum sodium figure before she left hospital was 335 mg. per 100 ml.; and serum potassium 21 mg. per 100 ml. It should be mentioned that a menstrual period again occurred during the first week of this last stage, when she was off salt treatment altogether. She was discharged home to lead a normal life. Since her discharge she has had no substitution treatment with salt or cortical hormone and has been leading as normal a life as is consistent with her psychological condition. She is obviously much improved, and there can be little doubt that the sodium withdrawal tests show that her cortical deficiency has been controlled by the grafting operation.

Table Summarizing Effects of Treatment

(1) *Jan.* 25, 1945–*March* 5, 1945 (5½ *weeks*):		
On admission	B.P. 120/80	
Off salt 7 days	B.P. 95/80 Na 295 K 21	
On salt 25 days (Operation after 8 days)	B.P. 115/85 Na 333 K 21	
(2) *March* 30, 1945–*April* 5, 1945 (6 *days*):		
Admitted for haematoma	B.P. — Na 300 K 33	
(3) *May* 11, 1945–*May* 29, 1945 (18 *days*):		
On admission	B.P. 115/75 Na 325 K 23	
Off salt 7 days	B.P. 112/70 Na 340 K 21	
(4) *Oct.* 22, 1945–*Nov.* 9, 1945 (18 *days*):		
On admission	B.P. 130/95 Na 310	
Off salt 8 days	B.P. 120/95 Na 365	(2nd exam. to confirm =340 a few days later)
(Menstrual period coincided, starting 2 days after salt withdrawal begun)		
(5) *Feb.* 25, 1946–*April* 3, 1946 (5½ *weeks*):		
On admission	B.P. 145/80 Na 335 K 20·5	
Off salt 7 days	B.P. 155/100 Na 330 K 20	
On salt 7 days	Na 340 331	(duplicate readings)
	K 23	
Off salt altogether 19 days	B.P. 155/110	(with emotional peaks ++ to 180 and feelings of "whizziness")
	Na 335	
(Menstrual period for first 7 days)	K 21	

The Donor.—When seen in June, 1946, she had made a satisfactory psychosomatic recovery except for slight facial hirsuties.

Discussion

The diagnosis of Addison's disease in this girl was based on the classic clinical picture—typical asthenia, pigmentation, gastro-intestinal symptoms, and low blood pressure. When she originally came under Dr. Wetherell's observation for this condition her blood sodium was 310 mg. per 100 ml.; six months later it had fallen to 284 mg. per 100 ml. When she came under our observation three months later she was taking extra salt and was on substitution therapy; an initial sodium withdrawal test for a week resulted in her blood sodium falling to 295 mg. per 100 ml., and her blood pressure to 95 systolic. We considered that the diagnosis of Addison's disease was established.

The patient's condition changed satisfactorily after operation and, in our opinion, as a result of it. Sodium withdrawal tests carried out for a week at a time at intervals as above stated showed that she no longer reacted to withdrawal of extra salt by a fall in blood sodium or a fall in blood pressure. In fact, in the first two sodium withdrawal tests in May and October, four and nine months after the operation, the blood sodium rose rather than fell at the end of the week's extra salt withdrawal, while the blood pressure remained at about the same level. In the final test, just over a year after operation, the blood sodium remained at a steady level after extra salt withdrawal, and the blood pressure was slightly higher at the end of this week's test. The results of these tests were obviously entirely different from the results of the tests before operation, and we felt it reasonable to assume that the cortical deficiency had been corrected. This was confirmed by the fact that following the final test the patient was able to leave off extra salt and carry on without any treatment at all. The last blood sodium reading, after three weeks off all treatment, was well within the normal limits, while her blood pressure at this time was actually showing readings that had never been recorded before. As a result of what we considered to be emotional reaction when her blood pressure was taken, readings as high as 180 systolic were found.

The results, therefore, of the grafting operation appear to have been extremely satisfactory, and if one can accept the blood sodium levels in similar salt withdrawal tests before and after operation as an indirect indication of the state of the cortical-deficiency sodium leak it would appear that the latter has been compensated by the adrenal graft. It was unfortunately impossible to get the measure of the leak by urinary sodium and chloride excretion estimations, but it would certainly have been interesting to have noted whether there was any raising of the renal threshold during the tests as an explanation of the high sodium figures noted after the second and third tests.

Further follow-up data will be published in due course, but as it is now over a year from the time of the operation we are hoping that the improvement will be maintained.

It is to be noted that in spite of the fact that this patient was grafted with an adrenal from a patient with the adreno-genital syndrome there is no evidence of that condition developing in her case, and her menstrual cycle remained regular throughout the period of observation following operation. Her 17-ketosteroids were estimated about two months after the operation and found to be within the normal range—10.3 mg. a day.

Summary

An account of a patient with Addison's disease is given. The grafting into this patient of a hypertrophied adrenal gland derived from a woman suffering from the adreno-genital syndrome (hyperplasia) is described.

Sodium chloride withdrawal tests indicated that the improvement in the patient's condition was due to the operation, and in particular that the blood sodium no longer fell below normal when the patient was taken off sodium chloride substitution therapy.

Cure has been maintained until the present time—fourteen months after operation.

LYMPHOCYTIC CHORIOMENINGITIS

BY

B. R. SREENIVASAN, L.M.S.Singapore

In 1910 Laubry and Foy described three cases of this disease, occurring in Paris, under the heading of "syndrome méningéal avec lymphocytie rachidienne d'origine indéterminée," and Rist and Rolland (1910) five cases of a similar condition as "méningite bénigne d'allure épidémique." In 1925 Wallgren, in a paper entitled "A New Infectious Disease of the Central Nervous System," reported a Swedish epidemic of 19 cases. J. Gibbens (1931) termed it "acute aseptic meningitis," and described the following characteristics of the condition: (1) An acute onset, with definite meningeal signs. (2) Meningeal changes in the cerebrospinal fluid; there is an increase of pressure and of cells, but the fluid is sterile on culture. (3) A uniform clinical symptomatology. (4) A relatively short benign course without secondary complications. (5) No epidemiological connexion with any known infectious meningeal disease. (6) There is no local infection such as otitis media or sinusitis.

Although it has been suggested that some of the cases described under various headings, such as "benign lymphocytic meningitis," "acute aseptic meningitis," and "lymphocytic choriomeningitis," have been really cases of lethargic encephalitis or poliomyelitis, it is now generally conceded that there is a disease *sui generis*, which is best termed "lymphocytic choriomeningitis."

Clinical Features.—The clinical features of the disease are as follows. The onset is acute, with fever, headache, and meningeal signs. The cerebrospinal fluid is clear or turbid, under increased pressure, and shows a pleocytosis varying from 60 to 1,500 per c.mm.; polymorphonuclears may predominate at the onset, but are rapidly replaced by lymphocytes; the total protein and globulin are increased, the sugar and chlorides usually being unaffected; the fluid is sterile on culture, and direct smears are negative for all organisms, including the tubercle bacillus. The prognosis is good, complete recovery occurring in two or three weeks as a rule.

Aetiology

Armstrong and Lillie (1934) isolated a virus from a case that appeared clinically to be encephalitis lethargica (St. Louis type). It differed from the virus of encephalitis, however, in the following characteristics:

(*a*) It was not pathogenic for rabbits.

(*b*) On intracerebral inoculation into mice the animals developed symptoms which are quite different from those produced by encephalitis. The incubation period was 6 to 7 days and fairly constant. "When lifted up by the tail a series of rapid jerky motions with the front and hind legs results, which conveys a pronounced sensation of tremor to the hand, readily distinguishable from that observed with normal mice. These rapid motions often pass into a convulsion, lasting from some seconds to a minute or more, in which the hind legs and toes are strongly extended and rigid, as is also the tail. The seizure may end in death or gradually relax, when the mouse may run about the cage apparently normal. Practically all the mice, however, ultimately die in convulsions, usually in from 1 to 3 days from the onset of symptoms."

(*c*) On post-mortem examination the mice showed marked cellular infiltration of the meninges, in which lymphocytes predominated, more pronounced on the base of the cerebrum and in the space between the hippocampus and the brain-stem. Also there is often a lymphocytic infiltration of the choroid plexus. No cellular gliosis is seen around the vessel sheaths as in encephalitis.

(*d*) In monkeys inoculated intracerebrally with the virus it is found to be present in the blood and cerebrospinal fluid.

(*e*) Intranasal inoculation has no effect.

(*f*) Cross-neutralization tests indicate that the two viruses are immunologically distinct.

More recently Findlay, Alcock, and Stern (1936) have isolated a virus from cases that correspond clinically with the picture of lymphocytic choriomeningitis and have shown this virus to be identical with that obtained by Armstrong and Lillie, thus establishing the aetiology of the disease.

Pathology

Viets and Warren (1937) have given the post-mortem findings in one of their cases. The report is here summarized:

> The meninges were oedematous, congested, and infiltrated mainly with lymphocytes and also a few endothelial cells. The cerebrum showed a localized oedema of the cortex just below the surface. Perivascular infiltration with lymphocytes and endothelial cells was present. Other cells resembling microglia and a few large cells four or five times the diameter of the lymphocytes with somewhat acidophilic cytoplasm and eccentric, large, and indefinite nuclei were observed. No inclusion bodies were seen. In the midbrain the changes noted were even more evident; in addition, in numerous swollen ganglion cells cytoplasmic inclusion bodies were seen, some of them being rod-like in shape and others round. In the internal capsule the reaction was less intense and no inclusion bodies were found. In the cerebellum and spinal cord perivascular infiltration and gliosis in the white matter were seen and there were no inclusion bodies.

Case Records

Hughes (1937) states that cases have occurred in Asiatics, but does not describe any. Below are recorded eight fairly typical cases that have been under my care in the third-class male wards of the General Hospital, Singapore. My colleagues and I have seen several other cases at the hospital.

Case 1.—A male Malabari Indian aged 21 was admitted on Oct. 6, 1938, with a history of fever for five days. No further history was obtainable. He was delirious on admission, being quite uncontrollable, and had to be kept under the influence of morphine and hyoscine. The neck was not rigid, and Kernig's sign was negative. There was no evidence of involvement of the cranial nerves or paralysis of the limbs. The temperature on admission was 103° F. (39.4° C.); it came down to normal on Oct. 9, but showed an occasional rise up to 100° F. (37.8° C.) from time to time. The ear-nose-and-throat examination was negative, and the fundi were normal. The blood Kahn test was negative (000). The cerebrospinal fluid showed the following changes: pressure increased, naked-eye appearance turbid; cell count, 542 per c.mm. (polymorphonuclears 65%, lymphocytes 35%); total protein, 80 mg. per 100 ml.; globulin + (Ross-Jones); sugar, 51 mg. per 100 ml.; chlorides, 660 mg. per 100 ml.; W.R. negative, Kahn test negative; direct smears negative for organisms (including T.B.); culture sterile; no clot on standing. On Oct. 11 the cerebrospinal fluid was clear; the cell count was 100 (polymorphonuclears 5%, lymphocytes 95%). On Oct. 23 the cerebrospinal fluid was clear, the cell count being 60 (polymorphonuclears 8%, lymphocytes 92%). The patient was discharged cured on Oct. 28.

Case 2.—A male Hokien aged 19 was admitted on Oct. 31, 1938, with a history of fever, headache, and a feeling of chilliness not amounting to a rigor, for one week. The temperature on admission was 101° F. (38.3° C.). On physical examination no abnormality was found except slight stiffness of the neck and a positive Kernig's sign. Examination of the central nervous system was normal. A lumbar puncture was done on Nov. 1, and the cerebrospinal fluid showed the following changes: cell count, 152 per c.mm. (polymorphonuclears 35%, lymphocytes 65%); total protein, 250 mg. per 100 ml.; globulin + (Ross-Jones); sugar, 10 mg. per 100 ml.; chlorides, 627 mg. per 100 ml.; direct smears negative for organisms (including T.B.); culture sterile; no clot on standing; W.R. negative, Kahn test negative. The blood Kahn test was negative (000), the fundi were normal, and the Mantoux test was positive. Lumbar puncture was repeated almost every day for the relief of headache, and a precipitin test done on the cerebrospinal fluid against the meningococcus was negative. On Nov. 7 the cell count was 155 per c.mm. and all the cells were lymphocytes. On Nov. 16 the cell count was 35 per c.mm., all the cells being lymphocytes; total protein, 150 mg. per 100 ml.; and there was no globulin (Ross-Jones). This man was discharged against medical advice, improved but not cured.

Case 3.—A male Tamil aged 22 was admitted on April 6, 1941, with a history of fever, weakness of the legs, and giddiness for two days. On admission the temperature was 101° F. (38.3° C.), there was rigidity of the neck, and Kernig's sign was positive. Examination of the central nervous system revealed no abnormality. A lumbar puncture was done on April 7, the cerebrospinal fluid showing the following changes: cell count, 900 per c.mm. (polymorphonuclears 4%, lymphocytes 96%); globulin + (Ross-Jones); total protein, 125 mg. per 100 ml.; sugar, 47 mg. per 100 ml.; chlorides, 745 mg. per 100 ml.; direct smears negative for T.B. and other organisms; culture sterile; no clot on standing; W.R. negative. On April 16 the cell count was 22 per c.mm., the total protein 50 mg. per 100 ml., and there was only a trace of globulin. The

fundi were normal, and the blood Kahn test was negative (000); the total white count was 7,500 per c.mm. (polymorphonuclears 60%, lymphocytes 36%, and large hyalines 4%). The patient was treated with repeated lumbar punctures and sulphanilamide 1 g. t.d.s. from April 9 to 15. The temperature came down on April 10 and remained normal. The patient was discharged cured on April 19 and returned to work on May 3.

Case 4.—A male Tamil aged 32 was admitted on April 22, 1941, with a history of fever, headache, and vomiting for one week. The temperature on admission was 103° F. (39.4° C.); the patient was drowsy and difficult to examine. There was neck rigidity, but Kernig's sign was negative. A complete examination of the central nervous system revealed no abnormality. A lumbar puncture was done on the day of admission, when the cerebrospinal fluid showed the following changes: naked-eye appearance, granular-looking; cell count, 206 per c.mm. (polymorphonuclears 18%, lymphocytes 82%); total protein, 70 mg. per 100 ml.; globulin + (Ross-Jones); sugar, 84 mg. per 100 ml.; chlorides, 705 mg. per 100 ml.; direct smears negative for T.B. and other organisms; culture sterile; no clot on standing; W.R. negative, Kahn test negative. The blood picture was as follows: total red cells, 5,700,000 per c.mm.; haemoglobin, 100% (Sahli); total white cells, 15,000 per c.mm. (polymorphonuclears 79%, lymphocytes 17%, large hyalines 3%, eosinophils 1%). The blood Kahn test was negative (000) and the fundi were normal. On April 29 the cell count in the cerebrospinal fluid was 50 per c.mm., 10% being polymorphonuclears and 90% lymphocytes. The patient was treated with sulphanilamide 1 g. t.d.s. from April 22 to 29. The temperature came down to normal on the 26th and remained so. The patient was discharged cured on May 3.

Case 5.—A male Hokien aged 26 was admitted on July 5, 1937, with headache and vomiting for three weeks. He gave a history of exposure to venereal infection on June 5 and had developed a urethral discharge and buboes on both groins on June 14. Clinically the case was one of lymphogranuloma inguinale, and Frei's intradermal reaction was positive. The blood Kahn test was negative. It was at first considered that the headache and vomiting were due to toxaemia resulting from the buboes. On July 12 the patient still complained of headache, and on examination there were stiffness of the neck and generalized hyperaesthesia. Kernig's sign was negative, and examination of the central nervous system revealed no abnormality. Lumbar puncture showed the following changes in the cerebrospinal fluid: pressure, 70 mm.—no change on compression of the neck veins; colour, yellow; cell count, 220 per c.mm., all the cells being lymphocytes; total protein, 550 mg. per 100 ml.; globulin ++ (Ross-Jones); sugar + ; no clot on standing; culture sterile; direct smears negative for T.B. and other organisms. On July 13, on cisternal puncture, the cerebrospinal fluid showed the following changes: pressure, 40 mm. (on jugular compression it rose to 100 mm.); naked-eye appearance, slightly turbid, almost milky; cell count, 290 per c.mm.; total protein, 90 mg. per 100 ml.; globulin + (Ross-Jones); sugar + ; chlorides, 675 mg. per 100 ml. There was no clot, and direct smears were negative for T.B. and other organisms. On July 15 lumbar puncture was repeated. The pressure was 140 mm., there being no change on jugular compression; the cell count was 680 per c.mm., all the cells being lymphocytes. By this time the general condition was improved and the buboes had subsided. There was a slight rise of temperature (up to 100° F. (37.8° C.)) from July 14 to 19, the course of the disease being otherwise afebrile. On the 21st slight headache and giddiness were still present, but there was no vomiting, the neck was not rigid, and Kernig's sign was negative. Repeated lumbar and cisternal punctures were performed, and on July 29 a block was still found. The total white count was 6,800 per c.mm. (polymorphonuclears 70%, lymphocytes 22%, large hyalines 5% eosinophils 3%). The W.R. of the cerebrospinal fluid was negative, and the colloidal gold test was also negative (0000000000). The patient was discharged against medical advice on Aug. 3, but was examined again on Aug. 10 and found to be free from all symptoms. Inquiries carried out several months later revealed that the patient had continued to be fit and was carrying on a normal life.

Case 6.—A male Cantonese aged 42 was admitted on Oct. 19, 1938, with a history of fever, headache, and pain in the bones for four days. Physical examination, including the central nervous system, revealed no abnormality; there was no rigidity of the neck and Kernig's sign was negative. As several cases of lymphocytic choriomeningitis had been encountered at this time, and as some of them had evinced few or no pointers to meningeal affection, a lumbar puncture was done, though neck rigidity and Kernig's sign were absent on repeated examination. The cerebrospinal fluid showed the following: pressure not increased; naked-eye appearance clear; cell count, 563 per c.mm., practically all the cells being lymphocytes; total protein, 120 mg. per 100 ml.; globulin + (Ross-Jones); direct smears negative to T.B. and other organisms; culture sterile; W.R. negative, Kahn test negative. On Oct. 29 slight congestion of the pharynx was noticed. On the 31st lumbar puncture was repeated, with the following findings in the cerebrospinal fluid: naked-eye appearance clear; chlorides, 643 mg. per 100 ml.; sugar 51 mg. per 100 ml.; direct smears, no T.B. or other organisms; all the cells were lymphocytes; culture sterile; precipitin test for meningococci, negative. The Widal and Weil-Felix reactions were negative, and the blood culture was sterile; examination of the ear, nose, and throat revealed nothing abnormal except a deflected nasal septum; the Kahn test on the blood was positive (444). There was irregular fever between Oct. 19 and Nov. 3, after which date the temperature remained normal. The total white count was 7,600 per c.mm. (polymorphonuclears 60%, lymphocytes 40%). The patient was given sulphanilamide 1 g. t.d.s. from Nov. 2 to 9. He was discharged cured on Nov. 9.

Case 7.—A male Tamil aged 23 was admitted on Oct. 22, 1938, with fever and stiffness of the neck for seven days but no headache. There was rigidity of the neck, but Kernig's sign was negative. Examination of the ear, nose, and throat revealed opacity of the antra on transillumination, but skiagrams showed no abnormality; the ethmoid cells were unusually large and numerous. The central nervous system was normal. The fundi were also normal. The blood Kahn test was positive (444). The temperature was 102° F. (38.9° C.) on admission, and there was irregular fever till Oct. 26, after which date the temperature remained normal. On Oct. 23 the cerebrospinal fluid showed the following changes: pressure increased (on jugular compression there was a definite increase); naked-eye appearance slightly turbid; cell count, 831 per c.mm. (polymorphonuclears 90%, lymphocytes 10%); total protein, 150 mg. per 100 ml.; globulin + (Ross-Jones); sugar, 11 mg. per 100 ml.; chlorides, 643 mg. per 100 ml.; W.R. negative, Kahn test negative; direct smears negative for T.B. and other organisms; culture sterile; no clot on standing. On Oct. 27 the cerebrospinal fluid was sterile on culture; the precipitin test for the meningococcus was negative; the cell count was 576 per c.mm., 6% being polymorphonuclears and 94% lymphocytes. The patient was given sulphanilamide 1 g. t.d.s. from Oct. 24 to Nov. 2, and was discharged cured on Nov. 9.

Case 8.—A male Tamil aged 30 was admitted on April 17, 1941, with a history of vertigo for two days. There were no other symptoms; the ear, nose, and throat were normal, the neck was not rigid, and Kernig's sign was negative. On standing or walking there was a tendency to fall to either side; this did not increase on closing the eyes. Otherwise, examination of the central nervous system revealed no abnormality. The blood picture was as follows: total red cells, 4,850,000 per c.mm.; haemoglobin, 83% (Sahli); total white cells, 6,800 per c.mm. (polymorphonuclears 60%, lymphocytes 18%, large hyalines 2%, eosinophils 20%). There were ancylostoma ova in the stools. Blood: April 18—W.R. ±, Kahn test ± (111); April 24—Kahn test + (333); April 30—W.R. +, Kahn test + (344). On April 21 the cerebrospinal fluid showed the following changes: naked-eye appearance slightly turbid; cell count, 280 per c.mm. (polymorphonuclears 94%, lymphocytes 6%); total protein, 75 mg. per 100 ml.; globulin + (Ross-Jones); sugar, 57 mg. per 100 ml.; chlorides, 715 mg. per 100 ml.; direct smears negative for T.B. and other organisms; culture sterile; no clot on standing; W.R. negative. On May 5 the cell count was 20 per c.mm., all the cells being lymphocytes. The patient was given sulphanilamide 1 g. t.d.s. from April 22 to 27, and was discharged cured on May 5.

Remarks

Case 5 was complicated by lymphogranuloma inguinale, and though one case of meningo-encephalitis (Rajam, 1936) has been described in this disease, the features of the present case seem to correspond to lymphocytic choriomeningitis rather than to meningitis of lymphogranulomatous origin. The only case of meningo-encephalitis recorded (referred to above) was accompanied by coma, fits, a temperature of 104.4° F. (40.2° C.), and proved fatal; the cerebrospinal fluid showed 90% of polymorphonuclears.

Cases 6, 7, and 8 had a positive blood Kahn reaction; but in my mind there is no doubt that these were cases of lymphocytic choriomeningitis and not syphilitic meningitis, in view of the following facts: (*a*) The histories were short; otherwise the clinical picture was typical of lymphocytic choriomeningitis. (*b*) The cases showed clinical cure without any antisyphilitic treatment. (*c*) The W.R. was negative in the cerebrospinal fluid in all those three cases; this is a very unusual finding in meningeal syphilis. In fact, I have seen hundreds of cases of meningeal syphilis and have never encountered one with a negative W.R. in the cerebrospinal fluid. (*d*) In Cases 7 and 8 the cell picture showed 90% and 94% of polymorphonuclears, respectively, on the first examination, and subsequently became predominantly lymphocytic. This is typical of lymphocytic choriomeningitis. A marked preponderance of polymorphonuclears is never found in meningeal syphilis at any time. (*e*) In Cases 7 and 8 there was a marked drop in the cell count in the cerebrospinal fluid without any antisyphilitic treatment.

Findings

The findings may be briefly summarized as follows:

1. Duration of illness: 2 to 21 days (average 7).
2. Race incidence: 5 Indians, 3 Chinese.
3. Age incidence: 19 to 42 years (average 27). It must be recorded here that only adults, as a rule, were admitted to these wards.
4. Number of days in hospital: 11 to 29 (average 19).
5. Fever: present in 6 cases.
6. Headache: present in 4 cases.
7. Giddiness: present in 2 cases
8. Vomiting: present in 1 case.
9. Weakness of legs: present in 1 case.
10. Mental symptoms: present in 2 cases.
11. Hyperaesthesia: present in 1 case.
12. Neck rigidity: present in 5 cases.
13. Kernig's sign: positive in 2 cases.
14. Cerebrospinal fluid: (*a*) Cell count varied from 152 to 900 per c.mm. (*b*) Sugar varied from 10 to 84 mg. per 100 ml. 5 out of the 8 cases were between 45 and 60 mg. per 100 ml. (*c*) Chlorides varied from 627 to 745 mg. per 100 ml.
15. Cases not treated with sulphanilamide spent an average of 22 days in hospital, whereas those treated with it stayed there for an average of 16 days. From these figures it is impossible to draw any definite conclusion as to the therapeutic value of sulphanilamide, but the clinical impression was that cases seemed to benefit from its use.

Conclusions

Lymphocytic choriomeningitis is a disease that occurs not uncommonly in Singapore, and, unless one is on the look-out for it, cases might easily be missed. Headache was complained of in only 4 cases and neck rigidity in but 5 cases out of 8; only 2 had a positive Kernig's sign. One of the cases was simply a pyrexia of unknown origin, and there was no symptom or sign pointing to the central nervous system; this case would certainly have been missed if a lumbar puncture had not been done. It would therefore be advisable to bear this disease in mind when dealing with any obscure case with fever, headache, giddiness, or vomiting. There was no history of a similar illness occurring in the household or intimate contacts of these cases; none of them showed any evidence of infection of the ear, nose, or throat; and there were no sequelae.

Summary

A brief account of the literature on lymphocytic choriomeningitis is given, with reference to the clinical picture, aetiology, and pathology of the condition.

As no cases have so far been actually reported in Asiatics, 8 instances of the disease are described.

All the cases were seen at the General Hospital, Singapore.

The cases conformed to the characteristics described by Gibbens (1931).

There was no death, and no sequelae occurred.

A warning is given that unless one keeps on the look out for such cases they might be missed.

I wish to thank the ear-nose-and-throat department of the General Hospital, Singapore, for the examination of these cases, and the pathology department, Singapore, for the reports (cultures, W.R., Kahn tests, and precipitin tests). I am greatly indebted to Dr. J. V. Landor, physician, General Hospital, for his invaluable advice, and to the Director of Medical Services, Straits Settlements, for permission to publish.

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The Illuminating Engineering Society has now reprinted the "I.E.S. Code for the Lighting of Building Interiors." This code was published in its original form in 1936 and has since been in great demand by all who are interested in the adequate lighting of homes, factories, offices, and public buildings. Copies may be obtained, price 1s. 6d., from the Society's office, 32, Victoria Street, London, S.W.1.

PATHOGENICITY OF GROUP C (LANCEFIELD) HAEMOLYTIC STREPTOCOCCUS

BY

R. IRENE HUTCHINSON, M.B., D.P.H., D.T.M.
Emergency Public Health Laboratory Service

Until recently it was believed that Group C (Lancefield) haemolytic streptococci were not frequent in human disease (Evans, 1944), and that when they did occur mild infections only were produced. Harper and Williams (1944), in reviewing the frequency of streptococci in the healthy nose and throat, found them in about 47% of their cultures, and of these only 1.6% belonged to the Lancefield Group C. The Cardiff Public Health Laboratory (1943), analysing the pathogens from acute cases of upper respiratory infection, found Group C streptococci in 7.2%. In a summary of cases of puerperal infection associated with streptococci that were not Group A, Ramsay and Gillespie (1941) reported 12 in which the Lancefield Group C was found. The pyrexia was mild and the infection low-grade. Cases have, however, recently been reported in which these streptococci were associated with severe infections. Thus Portnoy and Reitler (1944) isolated such an organism in an outbreak of acute cellulitis in which 27 people were affected and 4 died. Fatal puerperal infection has also been recorded (Rosenthal and Stone, 1940).

During a period of two years in a very small Public Health Laboratory 105 strains of Group C haemolytic streptococci were isolated. They came from cases of disease and from routine swabbings of maternity staffs and patients and of children in residential nurseries. The comparative frequency of this group compared with the other Lancefield groups isolated during the same period (to a total of 970) was as follows: Group A, 618 cases; Group B, 69; Group C, 105; Group D, 71; Group G, 107. It will therefore be seen that the occurrence is approximately one-sixth of that of the Lancefield Group A streptococcus—frequent enough, if they are pathogenic, to warrant consideration.

Distribution of Group C Streptococci

Of these 105 strains 32 were found in routine swabbings of throats and 4 in routine vaginal swabbings of pregnant women. In these cases they appeared to be saprophytic. The remaining 69 strains originated as follows: Acutely ill cases, 9; mild tonsillitis, 33; suppuration of soft tissues, 12; puerperal genital tract, 12; sputum (chronic bronchitis), 3.

Analysis of Cases.—The most acutely ill case was that of a middle-aged man who developed bronchitis which led within 10 days to a basal pneumonia with pleural effusion. A severe toxaemia, swinging temperature, and tympanites later set in, and suggested a typhoid or other septicaemia. The blood culture yielded a Group C haemolytic streptococcus. Recovery ensued with penicillin therapy. One case of severe cellulitis occurred after a septic soft-tissue lesion. Infection spread down to the bone, and amputation of the terminal phalanx had to be performed. A dental abscess resulting in osteomyelitis of the zygoma also yielded a pure growth of haemolytic streptococci of Group C.

Six of the strains came from septic throats, in which the patient was very ill with a raised temperature, enlarged glands, and sloughing foul necrotic debris on the tonsils. Swabs were sent in for differential diagnosis between Vincent's angina and diphtheria. Neither of these was present, but an almost pure culture of Group C haemolytic streptococci was obtained in each case. It is interesting that the somewhat large number of cases of mild tonsillitis came from widely separated sources from general practitioners who had been consulted with a complaint of sore throat. The presence of a congested red throat and lack of any membrane or debris were always noted. No other pathogenic organisms were present in any of these cases, so that the Group C streptococcus was held to be responsible.

The 12 strains from soft-tissue lesions were from cellulitis, gunshot wounds, abscesses, and ulcers. A Group C streptococcus was the only organism present, except in the case of the gunshot wounds and ulcers of leg. In these a mixed flora of

Staph. aureus (coagulase-positive), coliform bacilli, *Ps. pyocyaneus*, etc., was present. In no case was the patient acutely ill. Three of these 12 cases were associated with purulent discharges. Two were from vaginal swabs from an infant of a few months and a child of about 6 years, respectively. In neither case was any other pathogenic organism isolated, and although the children were not acutely ill they were definitely off colour and the local vaginal area and vulva showed much inflammation. The third case was that of a child with a copious purulent nasal discharge. The patient was suspected of being a chronic diphtheria carrier because of this discharge, but repeated examinations failed to isolate *C. diphtheriae* and always produced the Group C streptococcus.

Of the puerperal cases from which Group C streptococci were isolated from the genital tract, 5 were normal deliveries and the streptococcus was found solely as the result of routine swabbings. They caused no symptoms, and the puerperium was uneventful in each case. In 4 other cases with forceps delivery and extensive lacerations temperatures of from 99.8 to 101.8° F. (37.7 to 38.8° C.) were recorded and sustained for two to three days. Offensive lochia and uterine tenderness were noted. Rapid improvement and complete recovery followed sulphonamide therapy. In one of these the streptococcus was isolated from the throat and vagina before labour started; the other 3 had negative swabs on admission. Two patients after a normal delivery developed a mild pyrexia of a few days' duration (100–101.4° F.: 37.8–38.55° C.). Full recovery occurred. One patient, put into this category for convenience, was a gynaecological case. The trouble was diagnosed as uterine prolapse with cervicitis and erosion; colporrhaphy was performed, and she developed a mild pyrexia for a few days after operation. A pure growth of Group C streptococci was obtained from the cervix both before and after operation. The wound became clean and the patient recovered rapidly after sulphathiazole medication.

One strain was found on the anaesthetic machine of an operating theatre—a surprising finding, that suggests a possible source of hospital epidemic infection.

Significance of Group C Streptococci

It will be seen from the above series that in the majority of cases infection with these organisms does produce only mild lesions. In the genital tract they can exist as saprophytes, and, in spite of the local trauma of parturition, still cause no infection. With extensive lacerations, however, a mild uterine sepsis can be set up, so that the presence of these streptococci in the pregnant woman should always be noted. In the throat also the tendency is for a mild infection, but there is always a possibility of an acute and anginous inflammation. Infection of the soft tissues can be equally troublesome. In one of our cases it led to amputation of the phalanx of one finger, and in another to osteomyelitis of the zygoma.

It is difficult to assess the significance of the Group C streptococcus in the chronic bronchitis cases. Our 3 cases produced sputa with a mixed flora, but the Group C streptococcus very considerably outnumbered the other organisms. If not actually pathogenic, it would seem to be a great potential danger in view of the one case of bronchitis which led on to pneumonia and septicaemia. Here the patient was indeed gravely ill.

Bacteriology

All the strains gave clear-cut serological reactions with the Lancefield Group C serum, and soluble haemolysin tests were all positive. Biochemical investigation of 46 of our strains was carried out to see if there was any correlation between severity of lesion and type of streptococcus. All were inoculated into trehalose, lactose, sorbitol, and salicin–serum–peptone water, into plain broth, grown on 20% bile–blood, and tested for the presence of fibrinolysin. No correlation could be found between the severity of the lesion and the type of streptococcus causing it.

Sixteen of the 46 strains did not ferment sorbitol but fermented trehalose, thus fitting into Evans's (1944) description of *Str. equisimilis*. Of these 16, 4 did not lyse human fibrin and would therefore appear to be of animal origin. Of these 4, one was from a case of mild tonsillitis, one from a severe anginous throat, one from a chronic osteomyelitis, and the last from a routine vaginal swab. The other 12 which lysed human fibrin, and would therefore seem to be of human origin, also came from lesions of varying severity, including a case of severe cellulitis, 3 mild puerperal infections, and 1 abscess. The remainder were from routine swabs, presumably from carriers on whom they were saprophytic.

The large group of organisms (30 in number) which did not ferment either sorbitol or trehalose were at first suspected of belonging to the *Str. equi.* group. Further investigation, however, showed that they differed in other characteristics. All lysed human fibrin and fermented either salicin or lactose, or both. All grew rapidly in plain broth. Eighteen of these strains fermented both lactose and salicin, and included the strain isolated from the septicaemia. But as this group also included many of the mild tonsillitis and carrier strains pathogenicity did not seem to be particularly associated with it. Biochemical typing of the Group C streptococcus did not, therefore, appear to us at first to be of much practical value, but it was noticed that of 3 strains giving the same biochemical reactions (acid in trehalose and salicin, *nil* in sorbitol and lactose, positive for fibrinolysin, no growth in 20% bile) 2 were cervical swabs from mild puerperal pyrexial cases where these organisms were not grown from swabs taken on admission. The other was from the throat of a nurse in the same ward, thus suggesting the possible source of the infection.

Conclusion

It is suggested that the appearance of a Lancefield Group C haemolytic streptococcus in any lesion should be regarded with some degree of the apprehension which at present is bestowed on the Group A organism, and that, particularly in midwifery cases, its presence should be the signal for preventive measures to avoid cross- or auto-infection. Biochemical typing might be of value in tracing outbreaks of minor infection with Group C streptococci in maternity and surgical wards.

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CHEMICAL WARFARE EXPERIMENT USING HUMAN SUBJECTS

BY

H. CULLUMBINE, M.D., Ch.B., M.Sc.

(Chemical Defence Experimental Station, Porton)

Human subjects have been employed for many years to assess the value of certain types of potential chemical warfare agents and the efficacy of suggested defensive measures. All the subjects were volunteers, originally from the staff of the Chemical Defence Experimental Station, Porton, but later from the three armed Services. No one was subjected to a test without first being told the precise nature of the test and the possible consequences to himself. The tests were chiefly routine in nature, and hundreds of volunteers have been used in this way; "volunteers from the volunteers" were invited for any test involving risk of injury. The tests for which the subjects were used were roughly of two types—viz., offensive and defensive.

Offensive Tests

The offensive tests included the routine assessments of hundreds of possible lacrimators and sternutators. Volunteers were exposed to these compounds, which were dispersed in low concentration in a gas-chamber, and the times of onset and the severity of the typical signs and symptoms of irritation noted. The potency of each compound was determined in this way by comparison with the effects produced by the common standard lacrimators and sternutators. The more promising compounds were further assessed under more realistic conditions. Thus trained troops "attacked" over an assault course while being subjected to heavy concentrations of sternutatory clouds from generators, and their performance was compared with that when under the influence of a cloud of a standard sternutator

and again when no gas cloud impeded them. Simultaneous estimation of the chemical concentration of the gas clouds enabled a more precise assessment to be made. The irritant clouds from gas weapons were similarly assessed.

At the suggestion of Prof. Bartlett, of Cambridge, a constant vision test based on the rangefinder was used for the quantitative assessment of the harassment produced by lacrimators. Harassment-concentration curves were produced for the common lacrimators, and an interesting point noted was that for each lacrimator tested there appeared to be a critical concentration above which any further increase in concentration produced, at the most, only a small and militarily insignificant increase in harassment. Moreover, it would appear that in each case the critical concentration produced an approximately similar intensity of harassment—viz., about 50%. (100% harassment corresponds to complete blindness for the duration of the test.) This intensity of harassment is equivalent to a subject being blind for half the time of the test. The subject is, of course, intermittently blind, corresponding to the periods of intermittent blepharospasm which he suffers.

Moreover, it was noted that the human eye could become "tolerant," as regards both lacrimation and blepharospasm, to a given lacrimatory atmosphere, no matter what the chemical nature of the atmosphere, and whether the concentrations were high or low. The time for different subjects to acquire tolerance varied enormously—e.g., from 2 to 40 minutes—and this time for acquiring tolerance seemed to bear no relation to the concentration or the nature of the lacrimator. This tolerance was acquired whether the concentration was slowly falling or slowly rising, but a sudden marked increase in the concentration of the lacrimatory atmosphere broke down the tolerance. About a quarter of the subjects showed a definite relapse of tolerance, and in about a third of these the relapse was of a "phasic" nature—i.e., the lacrimation tended to return and then pass away periodically during the exposure to the lacrimatory atmosphere.

The effect of harassing agents against armoured fighting vehicles was also assessed. Trained crews manned the vehicles, which were then bombarded with projectiles containing harassing agents. A Service medical officer, travelling as "passenger," assessed the effects produced.

The effects of various vesicants on human subjects were also studied. New compounds were compared with the standard vesicants by placing different weights of the materials under test on the skin of volunteers and observing the effects produced. The vesicant power through various types of clothing and equipment and under different atmospheric conditions was determined. A numerical basis for assessment was introduced so that the results could be analysed statistically. This was based on the finding that the following mean times of exposure (in minutes) to mustard-gas vapour saturated at 30° C. are required to cause the development, in 24 hours, of the various types of burn, under normal English atmospheric conditions.

Description of Burn	Time in Minutes	
	Normal	Hot and Sweaty Skin
Faint red	1	0·5
Red	2	1
Red and swollen	3·5	2
Red and swollen, with		
(*a*) pinhead blisters	4	—
(*b*) small central blister	4	—
Blister	6	3·5

One interesting investigation was the comparison of the sensitivity of the skin of various regions of the body to vesicant damage. The following increasing order of sensitivity was discovered: palms of hands and soles of feet, palmar surface of fingers and back of hand and fingers, lateral surface of fingers and skin of the body generally, skin of the genitalia.

The burning power of vesicant vapours, both in the gas-chamber and in the field, was studied and the dosage of vapour to make a soldier a casualty determined by direct experiment. This was done under varying atmospheric conditions, too, by the use of a gas-chamber in which the relative humidity and the temperature could be controlled. It had long been known that hot and sweaty skin was more sensitive to vesicant vapour than was cool and dry skin, and by these experiments a more precise correlation between vapour dosage for casualty production and atmospheric variables was obtained. The factors involved in producing the increased sensitivity of hot and sweaty skins were also studied. Our experiments seemed to indicate that the amount of moisture on the surface of the skin was the main determining factor, the following order of increasing sensitivity to vesicant vapour being found: cold dry skin, hot dry skin, cold moist skin, normal (temperature) dry skin, normal moist skin, hot moist skin. This also probably accounts for the fact that under normal British climatic conditions the normally moist regions of skin—e.g., genitalia, axillae—react more severely to vesicant vapour than the rest of the skin surface (see Fig. 1).

FIG. 1.—Experimental mustard-gas vapour burns of the scrotum.

FIG. 2.—Burns caused by mustard-gas spray through clothing (24 hours after contamination).

The penetrative and burning powers of liquid vesicant drops through various types and conditions of clothing were also investigated. Different sizes of drops were used, and they were dropped from a height on to the clothed subject and at a terminal velocity corresponding to that of spray. From the results of these experiments calculations were made to estimate the degree of vesicant contamination required to make a soldier a casualty. The validity of these calculations was checked by direct exposure of soldier volunteers to vesicant spray in the field (see Fig. 2).

A somewhat similar problem was presented by the request to determine the burning power of phosphorus through various types of clothing. Here known quantities of burning phosphorus were dropped from a height on to clothed volunteers. (The phosphorus was supported on a 1-amp. fuse wire which, on passage of an electric current, ignited the phosphorus and allowed it to fall.) Calculations similar to the vesicant calculations were then made. The relation between vesicant-vapour dosage and reversible eye-damage was also determined, chiefly by means of a constant-flow method through an eye-mask.

Defensive Tests

The above offensive tests were a necessary preliminary to experiments designed to evaluate protective measures and equipment; the possible hazards had first to be determined before methods of defence could be formulated. Thus the methods used in assessing the value of protective devices were very similar to those already described. For example, vesicant injuries to the eye were produced and treated with various therapies. Decontaminating ointments, creams, powders, and solutions were tested on the contaminated skin of volunteers. Protective clothing and impregnated clothing were assessed on subjects exposed to vesicant vapour dispersed in the gas-chamber or in the field and in concentrations known to be normally damaging. The hazards presented by traversing or occupying contaminated ground, and methods of reducing them, were also determined, while the effect on military efficiency of wearing various types of respirators was measured by the use of fully trained soldier personnel.

Of course the experience gained by these large-scale experiments on human subjects was often utilized for non-chemical-warfare problems. Thus, to quote a few examples, the problem of facepiece and rubber dermatitis, the question of irritability of garments heavily impregnated with D.D.T., and an attempt to determine the factors involved in the production of khaki or textile dermatitis were typical commitments.

I wish to thank the Chief Scientific Officer, Ministry of Supply, for permission to publish this paper. I must also pay tribute to Surg. Capt. A. Fairley, R.N.(ret.), for long a lone pioneer in this work on human volunteers; to Lieut.-Col. S. Curwen, R.A.M.C.; and to many other colleagues at Porton whose work I have freely quoted. Finally, my sincerest thanks to, and admiration for, the host of volunteers who made all this work possible.

Medical Memoranda

Removal of Large Ovarian Tumour Complicated by Cardiac Failure

The interest in the following case lies in the size of the tumour removed and the remarkably rapid recovery of a failing heart as soon as the pressure thereon was eased.

Case Report

Early in 1946 an African village woman, aged about 50 and of average stature, was admitted to hospital at Winneba. She stated that she had suffered increasing abdominal girth for three years. She was found to be very thin, dyspnoeic, and slightly cyanotic. The cervical veins were full. Cardiac dullness was increased to the right. Cardiac rhythm was regular, rate 90 a minute at rest. The interval between the first and second apical sounds was increased. Both lower limbs were oedematous. The abdomen was grossly distended. Abdominal and pelvic examination revealed the presence of a smooth, firm tumour which appeared to fill the pelvis and abdominal cavity completely. Its upper limit could not be defined. The uterus and rectum were prolapsed. After a week's rest in bed her general condition improved slightly, and operation was decided upon.

Under open anaesthesia (3:2 ether-chloroform mixture) laparotomy was performed through a long right paramedian incision. This revealed a smooth, white, glistening tumour, areas of which were fluctuant, extending well down into the pelvis, where its pedicle could be felt on the right side. Laterally the tumour spread outwards into the flanks, and above was pressing on the liver. Fortunately the gut was not adherent to it. With considerable difficulty, owing to its size, the tumour was withdrawn from within the peritoneal cavity; the pedicle was clamped, the mass removed in one piece, and the abdomen closed. Camphor in oil had been given intramuscularly an hour before operation and nikethamide during the operation, when the pulse became feeble and irregular.

Examination of the tumour showed it to be a typical pseudo-mucinous cystadenoma of the ovary. The proportion cyst to solid was approximately two to three. The tumour weighed 41 lb. (18.6 kg.). After operation the patient made a rapid and uneventful recovery. She left hospital one month later in good health.

I am indebted to the Director of Medical Services, Gold Coast, for permission to publish this report.

A. F. Fowler,
Medical Officer.

Colonial Medical Service, Gold Coast.

Helminths Infective to Man in the Syrian Hamster

The Syrian hamster (*Cricetus auratus*), which is susceptible to several human diseases (e.g., leishmaniasis, tuberculosis, Weil's disease, etc.), is being increasingly used, both in this country and in America, as a laboratory animal. In a recent note Stunkard (1945) recorded the finding of the eggs of the dwarf tapeworm, *Hymenolepis nana*, in the faeces of a batch of these animals purchased for experimental purposes. Since this species is directly infective to man, requiring no intermediate host, that author stressed the risk of infection being acquired by laboratory workers, animal-house attendants, and others handling the animals. *H. nana* commonly occurs in rats and mice, and several workers (Saeki, 1920; Uchimura, 1922; Kiribayashi, 1933) have succeeded in infecting man with eggs from murine sources; hence there is ground for the belief expressed by Chandler (1922) and Faust (1939) that human infection may be acquired from eggs derived from rodents. Once acquired, human infection with *H. nana* may later reach serious proportions by reason of internal auto-infection (Hunninen, 1935).

In recent months a number of hamsters which had been used for experimental infections of kala-azar in these laboratories have been examined post mortem for helminth parasites. Out of a total of 160 animals, 19 (11.9%) were found to harbour *H. nana*, some being fairly heavily infected. One specimen yielded no fewer than 22 adult worms. Since most of these infected individuals belonged to one batch there is a possibility of a much higher incidence in other cases. Further, 83 animals (51.9%) were infected, some very heavily, with the oxyurid nematode *Syphacia obvelata*. This species is also believed to be infective to man, a case of human infection having been reported from an American child in the Philippines (Riley, 1919). Several more recent cases of *S. obvelata* infection have, however, proved to be spurious (Craig and Faust, 1945).

In view of the possibility of human infection with these worms having been acquired by contamination from the faeces of these infected hamsters, it was deemed advisable to make an examination of all personnel involved in handling the animals. Accordingly, two stool samples and seven N.I.H. swabs* at daily intervals were taken from the four individuals in question and examined respectively for the eggs of *H. nana* and *S. obvelata*. All were negative.

Hence, despite the fact that human infection with these helminth species does undoubtedly occur, and in view of the fact that no special precautions were taken in handling the hamsters, the risk of infection to laboratory workers and animal-house attendants does not, in practice, appear to be a serious one.

John M. Watson, A.R.C.S.
Helminthologist to the Wellcome Laboratories of Tropical Medicine, London.

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* The National Institute of Health "cellophane" swab devised by Hall (1937) for the diagnosis of oxyuriasis.

Reviews

X-RAY THERAPY FOR ACCESSIBLE CANCER

The X-Ray Treatment of Accessible Cancer. By D. Waldron Smithers, M.D., D.M.R. (Pp. 147; illustrated. 40s.) London: Edward Arnold and Co.

This is a monograph describing the experience at the Royal Cancer Hospital, London, in the treatment of cancer, chiefly of the skin. It is profusely illustrated with photographs of apparatus and of patients, and with isodose curves applying especially to the use of contact *x*-ray therapy in the treatment of skin cancer. The clinical photographs include some striking examples, in colour and in black and white, showing both radiation reactions and clinical results in skin cancer and cancer of the lip. The text is clearly written and the author brings out the essential points of the principles influencing the choice of technique and of apparatus. A chapter is devoted to classification and staging of cancer with a full account of records, including a punch card system for abstracting information from the records, making use of punching, and sorting by hand.

In a clear but somewhat technical account of the mode of action of radiation on malignant cells, the author correlates conclusions reached by several workers in cytological fields and stresses the need for studying the response to radiation of individual tumours. Examples are given of attempts to do this by means of differential cell counts, and a number of such counts, graphically represented, is given. While with most of these the clinical result corresponds with the indications of the cell count, one (Fig. 39) shows an unfavourable cell count, but a good clinical result, 2½ years after treatment. This result calls into question the whole method. The techniques used are clearly described, and full use has obviously been made of isodose data provided by the physicist, together with ingenious devices to ensure accuracy and ease of treatment with protection of structures, such as the eye and mucous membranes, which should not be treated. A test of statistical significance of results is used to show that a fractionated is better than a single-dose method of treatment, but the author is in error in comparing his own figures for fractionated treatment with those of another clinic for a single-dose method.

The book is attractively produced, and interesting to read. The author and publishers are to be congratulated on the project and its fulfilment.

BIOLOGY OF CELLS IN TISSUE CULTURE

Biology of Tissue Cells. Essays. By Albert Fischer, head of the Biological Institute, Carlsberg Foundation, Copenhagen. (Pp. 348; illustrated. 31s. 6d.) Copenhagen: Gyldendalske Boghandel Nordisk Forlag; London: Cambridge University Press. 1946.

Though not indicated in the title, this book actually deals with the biology of cells in tissue culture. It is not a monograph or textbook of tissue culture, but a series of essays based on the author's own experimental data, and on those of other workers, and it considers the subject from the standpoint of the biology of tissue culture cells and their relation to the life of the tissue cells in the whole organism.

The results of tissue culture studies have proved to be a disappointment to histologists of the old school, because in culture the morphological characters of the cells are lost by dedifferentiation, so that finally only three types of cell are morphologically recognizable—viz., reticular tissue cells (fibroblasts), mosaic tissue cells (epithelium), and wandering cells. Thus, chondrioblasts, osteoblasts, muscle fibres, and cardiac muscle cells become morphologically identical as "fibroblasts." But although morphologically indistinguishable, the cells retain certain potentialities characteristic of the embryonic stage from which the explant originates. Thus, the tissue culture provides interesting material for the study of characters, other than morphological, by which the cells differ from one another. In the last analysis no doubt these differences depend on chemical differences, as is already admitted to be the case with morphologically indistinguishable cells from different species of animals.

The author advances evidence in support of the view that the tissue culture represents, not a cell colony in the real sense of the term, but an organism-like system, or tissue-cutting, presenting signs of organization, of polarity, of regeneration when injured, and of mutual dependence of the cells on one another, involving some elementary division of function. Why it grows only to a certain size, what stimulates its growth and its polarity, and what factors inhibit growth are subjects to which the author has given much thought.

The book is interesting and stimulating, and, on the whole, written in excellent English, on which the translator is to be congratulated. All the same, the language could have been improved by an English editor: the punctuation is at times odd, and the use of such words as "loose" for "lose," "longtime" for "prolonged," "blood coal" for "blood charcoal," etc., give an awkward tang to the reading. This is perhaps captious criticism of a laudable effort: one would be happy to be able to write a foreign language oneself half so well. The print and get-up are excellent.

BILIARY AND ALIMENTARY ANASTOMOSIS

Operative Anastomoses Between Biliary and Gastro-Intestinal Tracts. A Review of Earlier Literature and a Clinical Study of 809 Swedish Cases. By Gunnar Redell. (Pp. 371; illustrated. No price given.) Uppsala: Almqvist and Wiksells Boktryckeri-A-B.

To collect and analyse the details of some 800 cases of any surgical condition is a herculean task, but it has been successfully undertaken by Dr. Gunnar Redell of Uppsala, whose *Operative Anastomoses Between Biliary and Gastro-Intestinal Tracts* first published in Sweden in 1940 has now been translated into English. The main part of the book consists of summarized histories of 809 cases of such anastomoses culled from all the Swedish hospitals in the period 1914–38, but in the first 180 pages the author gives an excellent review of the previous literature and discusses all important aspects of the subject, experimental, pathological, and operative. Fourteen separate indications for these operations are detailed, including cancer of the pancreas, stricture of the bile ducts, accidental and post-operative lesions (which in view of the findings of the previous records we were surprised to see accounted for but 44 of the 809 cases), dyskinesia, stones, and congenital conditions.

We think that the surgeon will not find anywhere a more complete or balanced analysis of the very considerable literature which in the author's bibliography extends to 1,100 articles and papers. We note with commendation that this list is world wide in its embrace and not limited, as is too often the case in monographs, to the literature of one or two countries. For this reason it was all the more surprising to find no reference to E. Horgan's volume on *Reconstruction of the Biliary Tract*, which is the only other extensive monograph we have come across covering much the same territory. However, this small omission in no way detracts from the great value of Dr. Redell's book, which will for long remain the most informative guide to a rather involved subject. That it needed attention is obvious from the high overall mortality which the author quotes from the literature and which his own statistics corroborate, only 146 of his series, many of which of course were cases of irremovable neoplasm, being alive at the time of the investigation. In 89 of these barium meal examinations were done, and at the end of the book a series of half-tone radiographs and of line reproductions, showing the degree to which the contrast medium entered the biliary system via the anastomosis, greatly enhance its practical value.

The book is one we can unhesitatingly recommend to the surgeon who is particularly interested in this important branch of his subject and can procure a copy from Uppsala.

DYNAMIC PSYCHIATRY

Principles of Dynamic Psychiatry. Including an Integrative Approach to Abnormal and Clinical Psychology. By Jules H. Masserman, M.D. (Pp. 322; illustrated. 20s.) London: J. B. Lippincott Company.

In this book the author has tried to integrate various biological and psychological disciplines into a biodynamic theory of behaviour and to check the principles of this theory against animal experiment, clinical observations, and the rationale of various forms of therapy in the behaviour disorders of man. The first part is concerned with definitions of the scope of psychiatry followed by a description of psychological and psychopathological concepts. The psychoanalytic approach is discussed and the psychoneurotic and psychotic reactions are

described. In the second part all this is correlated with experimental work on animals and various criticisms are dealt with. Appendices comprise a full case history of a psychoneurotic with psychosomatic symptoms, the psychoanalytic formulations of the psychoses, a list of films suitable for teaching purposes, and a note on principles of group communications used in propaganda. There is a full bibliography and a glossary of psychiatric terms to complete the book.

As a work of reference this volume is of undoubted value, but it is written in a style which makes consecutive reading difficult, and the use of many technical terms unfamiliar to the general reader makes the glossary essential. Nevertheless the approach to psychiatric problems is a rational one and represents the general trend of modern psychiatry. We shall look forward with interest to the forthcoming volume on the practical application of the theories formulated in the present work.

AN AUSTRALIAN SURGEON'S MEMOIRS

In My Fashion. By Herbert M. Moran. (Pp. 310. 15s.) London: Peter Davies. 1946.

For the friend becoming increasingly restive during a long convalescence, for the retired doctor who finds that the world has been steadily going from bad to worse since the days of his youth, and for anyone who enjoys wit, zest, pugnacity, lost causes, and tilting at windmills this work would be an excellent gift. The author, an Australian surgeon, died of a malignant melanoma just before the book was published, and his account of his disease in the last chapter is a moving example of that form of literary expression at which the British have always excelled: eloquent acceptance of death.

However, Mr. Moran was pre-eminently a skilful *raconteur*, and most of the book is composed of anecdotes about psychopaths, malingerers, homosexuals, eccentrics, and bemused illiterates that he encountered while serving in the R.A.M.C. during the recent war—the "poor types," as they were called—the "submerged tenth" of our population. The treatment accorded to these men by the Service authorities, and in particular by the psychiatrists, roused the author to criticisms that are always scathing, often unfair, but certainly entertaining; and his observations on the effects of the "dole," medical certification, and incoordination between the medical Services will find an echo in the hearts of many doctors even if their minds consider his judgments rash and biased.

A sympathy with the Italian people (he knew the English colony in Italy well) and with Mussolini, whom he met on several occasions, caused the author to condone the Abyssinian venture to the extent of volunteering to serve with the Italian army in Africa. His adventures there are vividly described, but his sympathetic attitude to the campaign must be repugnant to most Englishmen to-day.

Notes on Books

Bulletin No. 6 of the Industrial Welfare Division of the Australian Department of Labour and National Service deals with *Atmospheric Conditions in Australian Textile Mills*. It describes the temperature, humidity, and air movement experienced in half the textile mills of Australia, which employ four-fifths of the workers in the industry. The observations are presented in the form of charts which show the range of dry-bulb temperature and humidity found to be (*a*) comfortable for the operative, (*b*) uncomfortable for them, and (*c*) harmful, within the endurance limit indicated. Other sections of the Bulletin discuss the frequency of difficult outside atmospheric conditions, the control of radiant heat, and the maintenance of clean air. The Bulletin should prove a useful guide to factory managers, especially those engaged in worsted and cotton spinning. Booklet No. 3 reports on *Industrial Accident Records, their Compilation and Use*. The booklet describes the system used in a number of Australian factories during the past two years, and follows the standard methods recommended in this country by the Royal Society for the Prevention of Accidents. It also embodies schemes which aid the collection and tabulation of accident data, and relate the occurrence of accidents to definite causes. Both publications may be had from the Department of Labour and National Service, Nicholas Building, 37, Swanston Street, Melbourne.

Self. A Study in Ethics and Endocrinology, by MICHAEL DILLON (William Heinemann Medical Books; 6s.), is a plea for the understanding of self, not only of oneself but of other selves, for only thus can there be any advance in charity, in civilization, and in a true ethic. In the compass of 122 pages the treatment of this subject cannot be anything but superficial, but it is at least provocative of thought. The first part deals with the influence of the body, especially of the endocrine system, and this is illustrated by a discussion of the vexed subjects of homosexuality and hermaphroditism and the biased and prejudiced attitude of the public towards these problems. In the second part the question of the mental correlates of these bodily processes is dealt with in chapters on personality, the masculine and feminine type of mind, and free will. None of these problems does the author solve, nor does he pretend to, but he approaches them with an open mind and not, as some professional endocrinologists, psychiologists, and other-ologists, exclusively from the standpoint of their own specialties. The chief object of this readable and pleasantly written little book will be to stimulate thought and (we hope) further reading.

The United States are justifiably proud of the memory of William Beaumont. As Dr. John Fulton points out, his physiological observations on Alexis Saint Martin were of the greatest significance. On the basis of one well-studied case Beaumont was able to change the course of medical thought in the sphere of the physiology of digestion. We turned, therefore, with pleasant anticipation to a book with the engaging title *William Beaumont's Formative Years* (New York: Henry Schuman; $6.00), but we must admit to our being rather disappointed. The book merely comprises two of Beaumont's early notebooks, 1811 to 1821, with annotations and an introductory essay by Genevieve Miller. These diaries record everything that interested him greatly, whether what he observed himself or what interested him in the writings of others. It is an unclassified collection of his thoughts and might provide the material from which his formative years could be clearly grasped. The book is handsomely produced with a number of pleasant contemporary illustrations.

We welcome a second edition of Dr. OTTO SAPHIR'S *Autopsy Diagnosis and Technic* (New York, Paul B. Hoeber, $5). The book remains of reasonable size in spite of revision and enlargement and contains a vast amount of useful information expressed in concise and attractive language. The gross changes in diseases of the breast, vitamin deficiencies, and tropical diseases are now included, and the investigation of accidental death has been more thoroughly dealt with. The opening chapter, concerning the legal aspects of obtaining permission to perform the necropsy, is of considerable interest. Most of the book is occupied by short pithy descriptions of morbid processes. As the author explains, this part is not designed to rival a textbook of pathology but to serve as a working guide to aid in the recognition of demonstrable anatomic lesions. The book will certainly be of assistance to those whose experience of carrying out routine post-mortem examinations is limited.

Dr. WILLIAM BROWN'S book entitled *Personality and Religion* (University of London Press; 9s. 6d.) is, in the main, a revised and abbreviated edition of *Mind and Personality*, in which he has incorporated chapters from another of his books, *Science and Personality*, all of which have been out of print for some years. We note that he now lays very little stress on abreaction, of which, in the past, he was the leading exponent. In its present form the book embodies the results of twenty years' further experience in deep mental analysis of psychoneurotic patients as well as of more normal personalities. He also elaborates his helpful conception of the contrast between individuality and personality, which is perhaps the most interesting feature of the book.

It must be said at once that *A Pocket Obstetrics*, by ARTHUR C. H. BELL (J. and A. Churchill; 7s. 6d.) is an excellent little book. The "attempt to present the fundamental lines of approach to the practice of obstetrics both normal and abnormal" has succeeded. When read in conjunction with her practical work the pupil midwife will find all that she requires here. The busy general practitioner and midwife could use this book for rapid reference with benefit, and the harassed medical student during revision will be grateful for the logical presentation of a subject never easy to master. The publishers are to be complimented on the high standard of the production. The attached bookmark may be copied with advantage to themselves and to the reader by many other publishers.

Pending a complete revision of the *Ship Captain's Medical Guide* a new edition has been printed for the Ministry of Transport. This 18th edition, besides new material, contains information which has been issued in the form of Notices to Masters. The medical scales have now been omitted and are published separately. Copies of the *Ship Captain's Medical Guide* (price 3s. 6d.), of the medical scales, and of amendments to each of these publications may be bought directly from H. M. Stationery Office, or through any bookseller.

The Royal Life Saving Society has published a twenty-first edition of its illustrated *Handbook of Instruction* which sets out the methods approved by the Society for release and rescue of the drowning, and for resuscitation of the apparently drowned. It is published at 2s. from 14, Devonshire Street, London, W.1.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY OCTOBER 19 1946

THE FUTURE OF PENICILLIN

We are glad to announce the publication of a full-scale work on penicillin by British writers.[1] Edited by Sir Alexander Fleming, who is himself the author of two chapters, it includes contributions by 27 other workers and covers the whole field of its subject, from chemistry, manufacture, pharmacy, and pharmacology to every form of clinical application. There is necessarily some variety in style and method among so many writers, and even difference of opinion among them on minor points, but such lack of uniformity is more than counterbalanced by the advantage of having contributions from those who have special experience in particular fields. The scope of penicillin treatment is so wide that no one can have had practical experience of all aspects of it: it includes, for example, such specialized spheres as ophthalmology, major chest surgery, venereal disease, and plastic surgery. The obstetrician, the dermatologist, the orthopaedic surgeon, and others have also had the opportunity of discovering what penicillin can do in facilitating their work, and the fruit of all their experience will be found here.

A study of this book will provide almost any reader with new ideas for ways of using penicillin, and, unless the constantly reiterated injunction to determine whether or no the infection is caused by a penicillin-sensitive organism is well observed, it may safely be predicted that a good deal is going to be wasted. Bacteriological investigation, though always advisable unless the clinical diagnosis decides the nature of the infection, would seem to be particularly necessary in peritonitis and other acute abdominal conditions, in which the usefulness of penicillin has yet to be fully determined, and in infections of wounds, of the air passages, and of the urinary tract. Several important applications will probably be new to many readers. One is the treatment of sepsis neonatorum, a term here used to describe many of the possible effects of the "neonate's" first contact with the microbic world, and including umbilical infection, nasopharyngitis and pneumonia, skin infections, and various other forms of sepsis. Of 69 such cases treated at Great Ormond Street 60 could be investigated bacteriologically, and in precisely two-thirds of them the infection was staphylococcal; there is thus more than an even chance in such a case that the organism concerned will be penicillin-sensitive. Since infants need very small doses compared with the adult, there need be no hesitation in giving any doubtful case the benefit of penicillin; indeed, this appears to be a branch of treatment in which the extravagant method of oral administration might well be exploited fully. Another and much wider application is to "cover" an operation which normally carries a serious risk of sepsis; examples of this vary from dental extraction in rheumatic subjects to Caesarean section in an advanced stage of labour. Penicillin inhalation still requires further study, but it has been shown to be a possible alternative to injection for producing a systemic effect, and has been found to give good results in certain infections of the air passages and lungs, particularly in some cases of acute bronchitis. In this connexion it is interesting that the Swiss authors P. Geiser, K. Schaub, and H. Staub[2] have recently claimed good results by this method even in the treatment of pneumonia.

With this up-to-date review of the present achievements of penicillin treatment before us it is tempting to speculate on future lines of development. An unknown factor on which these must largely depend is the supply position. It is true that supplies are understood to be adequate for normal and legitimate use in this country, but no one can foretell what the consumption may be in the first wave of popular demand. Moreover, many other countries still have little or none, and we should presumably export any surplus over normal requirements in the interests both of humanity and of the national exchequer. But to anticipate a day when supplies will really be unlimited and perhaps cheap—what can we do which is not being done now? Quite the most extraordinary property of penicillin is that it is for all practical purposes non-toxic; enormous doses can be given without fear of ill effect if there is anything to be gained by doing so. Perhaps the only contraindication to a large dose is in the treatment of gonorrhoea, when it may unduly mask the subsequent signs of coincident syphilis. There is little doubt that larger doses will be given for the treatment of most conditions, if only in order to prolong the interval between injections. Possibly administration by the mouth, which calls for about five times the intramuscular dose, will come into favour, at least for less serious conditions. Finland[3] and others[4] in America have already shown that this is a perfectly feasible method of treating gonorrhoea and even pneumonia. We shall also doubtless see an enormous extension of prophylactic use, embracing wound treatment, surgical operations of all sorts, obstetrics, and even some of the risks of social intercourse. Animals must not be forgotten: there is a chapter on veterinary use in this book, and the scale of dosage required in a cow is considerable.

Perhaps more important than any of these things is the possibility of extending the scope of penicillin treatment to infection by less sensitive bacteria. It is unfortunate that simplicity of statement should hitherto have demanded the categorization of bacteria into sensitive and resistant species. There is no such clear distinction among many of them, but every gradation from sensitivity to as little as 0.01 unit per ml. to resistance to several hundred units. *H. influenzae* is classed as insensitive in one chapter here, and recognized as reasonably sensitive in another; it is actually quite sensitive enough, as was pointed out originally by P. Forgacs, R. Irene Hutchinson, and R. E. Rewell[5] and by

[1] *Penicillin, its Practical Application*, 1946, Butterworth and Co., 30s.

[2] *Schweiz. med. Wschr.*, 1946, **76**, 285.
[3] *J. Amer. med. Ass.*, 1945, **128**, 315.
[4] Ibid., 1945, **129**, 320.
[5] *Lancet*, 1945, **1**, 785.

M. Gordon and K. Zinnemann[6] in this Journal to justify good hopes of benefit from intrathecal injection in *H. influenzae* meningitis. These observations have been confirmed by W. L. Hewitt and Margaret Pittman,[7] who add the interesting observation that penicillin X is more active against this organism than penicillin G, although streptomycin is rather better than either, both *in vitro* and experimentally *in vivo*. *Proteus* is condemned as insensitive in two clinical chapters of this book; it is in fact usually inhibited by about 8 units per ml., a concentration which is readily far exceeded in the urinary tract, if nowhere else. Almost all authors have agreed in disregarding typhoid bacilli and other *Salmonellas* as hopelessly resistant, in spite of Florey's prophecy made five years ago that with more and better penicillin we should come to the stage of attacking these infections. That prophecy is now fulfilled. Bigger having shown that penicillin and sulphathiazole exert a synergic action on *Salm. typhi*, C. J. McSweeney[8] has treated six cases of typhoid fever with full doses of sulphathiazole and large doses of penicillin—2,500,000 units daily—with apparently remarkable results.

These things were better left unsaid if they encourage indiscriminate use. Such adventures as the exploration of new fields of treatment are only for hospitals where the most thorough clinical and laboratory control can be carried out. In private practice disappointment can be avoided only by adhering to accepted lines of treatment, and these may at last be learned from a comprehensive home-produced publication.

EVOLUTION OF JOURNALS ON GENETICS

There are a few men of science of whom it can be said that their work and influence left a branch of knowledge so radically altered that it is difficult to conceive what the course of development would have been without them. Among this company must be included Karl Pearson. If to-day there are flourishing schools of statistics, if what would have seemed but a few years ago to be refined applications are now almost commonplace in hygiene, in medicine generally, and, in fact, in almost every division of experimental science, then we must recognize that it is to Karl Pearson above all that our thanks are due. Those distinguished men who have so ably built upon the foundations he laid would be the first to acknowledge their debt.

The more tangible of the things that Pearson has handed on to another generation, apart from a vast collection of published works, are the Galton Chair of National Eugenics, at University College, of which he was the first incumbent, the Francis Galton Laboratory for National Eugenics, and three journals of which he was the founder —*Biometrika*, the *Annals of Eugenics*, and the *Treasury of Human Inheritance*. *Biometrika* was founded in conjunction with Francis Galton and W. F. R. Weldon) in 1901 and continued to be edited by Pearson till his death in 1936, since when the editor has been his son, Prof. Egon Pearson. *Biometrika*, an essential requirement and handbook for every statistician and biometrician, has included much else of outstanding value and, indeed, stamped as it is with the vigorous personality of its founder, much to interest and entertain the more general reader. There are not many scientific journals that would publish an article extending to a hundred pages, together with more than a hundred pages of plates, on the skull of Oliver Cromwell. Nor would the name *Biometrika* lead the reader to expect the occasional re-writing of history (and who shall say wrongly), just because the editor-author enjoyed doing it. Even he, however, appears to have shrunk from saying of George Buchanan to an audience at the University of Edinburgh: "Chief among these venal liars, and perhaps, owing to his great literary gifts, the basest hireling scholar of all the ages, stands George Buchanan," for we find this remark not in the published lecture on Buchanan's skull but in another paper, not read to a Scottish audience.

The *Annals of Eugenics* has a shorter history. The first number appeared in 1925, and five volumes had been completed when, in 1934, the editorship passed, with the Galton Chair, to Prof. R. A. Fisher. In founding the *Annals* Pearson felt that "the time seems fully ripe for the issue of a journal which shall devote its pages wholly to the scientific treatment of racial problems in man." From the beginning papers were included which dealt with human genetics, but the chief emphasis was laid on the national group as the most important unit, a sentiment enshrined in the "National" which precedes the word "Eugenics" in the titles both of the Chair and the Laboratory. While maintaining the high tradition of the *Annals* Prof. Fisher laid more emphasis on the individual aspects of the subject, together with the background of mathematical statistics needed for the solving of genetic and related problems. The change in the subtitle from "A Journal for the Scientific Study of Racial Problems" to "A Journal Devoted to the Genetic Study of Human Populations" sufficiently expresses this alteration. As might have been expected of one of the leading scientific men of our own day, the seven volumes issued under Prof. Fisher's editorship represent a remarkable achievement, and every serious student of human genetics, and of some other subjects too, needs them for constant reference.

Last year the Chair and the editorship of the *Annals* passed to Prof. L. S. Penrose. Prof. Penrose, with his background of mathematics, psychology, and medicine, has made notable contributions in the field of human genetics, psychiatry, and mental deficiency. For a number of years before the war he was Research Medical Officer at the Royal Eastern Counties Institution at Colchester. From 1939 until his recent appointment to the Galton Chair he held a research post in Canada. Among his notable publications may be mentioned a very fine and thorough survey of 1,280 cases of mental deficiency. This monograph, prepared with characteristic care, will remain a valuable storehouse of information for years to come. His work on maternal age in relation to mongolism and his studies on phenylpyruvic amentia may also be singled out as examples from a long list. The first medical holder of the Chair has naturally made some further alteration in the policy of the *Annals*, which will in future be more specifically concerned with medical genetics, and the sub-title now becomes: "A Journal of Human Genetics." Two numbers have appeared under Prof. Penrose's editorship and it is clear that the *Annals*, while maintaining its high standard, and without excluding a proportion of highly technical papers, will in future have a more direct appeal to the

[6] *British Medical Journal*, 1945, **2**, 795.
[7] *Publ. Hlth. Rep., Wash.*, 1946, **61**, 768.
[8] *Lancet*, 1946, **2**, 114.

medical man and a most powerful appeal to those medical men with a special interest in genetics.

The third publication, the *Treasury of Human Inheritance*, conceived on the same generous scale as the others, is a unique source of genetic data. For some years the only writer (with collaborators) has been Dr. Julia Bell, whose admirable monographs have been universally praised. It is to be hoped that she will continue to produce them. We are told that in addition the *Treasury* will now be used for the publication of data too extensive for the *Annals* or not in themselves of immediate medical significance. In this way a fine body of material will be built up for future reference.

The Galton Chair has a twin, the Weldon Chair of Biometry, the first and present holder of which is Prof. J. B. S. Haldane. Amongst his many distinguished activities Prof. Haldane has made contributions of the greatest importance to human genetics. He and Prof. Penrose are certain to do much for the subject in the future, while the journals will be unique as a medium of publication in this field.

HENS' EGGS AND SALMONELLA INFECTIONS

In a previous annotation[1] we discussed eggs as reservoirs of salmonella infections and pointed out that ducks' eggs were definitely implicated as a cause of food poisoning in man, but that the egg of the hen had a much cleaner record. Though this is still true, evidence is slowly accumulating that strains of salmonella of food-poisoning type may be associated with hens' eggs. The increased use of dried eggs in this country makes the subject of great practical importance. A recent paper by F. E. Chase and M. L. Wright[2] gives particulars of the examination of 2,400 hens' eggs for salmonella strains. Of these eggs 1,000 were laid by fowls which reacted to the *S. pullorum* strain and were therefore from infected flocks; *S. pullorum* was isolated from 61 eggs (6.1%). This strain, however, is harmless to man. No salmonella organisms were obtained from the exterior of 400 eggs in this group. The other 1,000 eggs were from healthy flocks, and no salmonellas were isolated. On the other hand, examinations of dried egg powder made from hens' eggs have been less reassuring. For example, N. E. Gibbons and R. L. Moore,[3] examining Canadian egg powder, found salmonella strains in 28 samples (7.4%), and all but 5 (*S. pullorum*) were potentially pathogenic to man. There have been outbreaks of food poisoning in man, associated with the use of dried egg powder, during the war in this country.

While outbreaks of food poisoning implicating hens' shell-eggs are excessively rare, J. Watt[4] described an outbreak of twenty-eight cases of food poisoning on board a merchant vessel due to *S. montevideo* in hens' eggs eaten in a salad. The strain was isolated from several of the unused shell-eggs. M. Crowe[5] in this country has described a small outbreak of food poisoning very probably caused by a hen's egg. The case against the duck is not only that pathogenic salmonella strains are found but that ducks are liable to infection with these strains, and the organisms are then present in the egg yolk. Certain varieties of duck seem to be especially liable to this infection. So far this chain of evidence seems to be lacking for the hen. The nearest approach to it is contained in an important paper by R. F. Gordon and A. Buxton[6] dealing with the isolation of *S. thompson* from outbreaks of disease in chicks. This strain is a fairly frequent cause of food poisoning in man. The authors isolated it during 1943 and 1944 on forty-four occasions from thirty-one outbreaks in chicks and two in ducklings. This organism was isolated from the intestinal tract of two adult fowls but not apparently from the interior of any eggs.

Many more investigations are necessary before any final opinion can be given, but the present position seems to indicate that fowls can harbour salmonella strains which are potentially pathogenic to man. There is no evidence, however, that specific infections with these strains can infect the egg yolk, as in ducks' eggs. Their presence in hen excreta explains how in dried egg mixtures it is possible to find pathogenic salmonella strains. The method of preparation of dried egg powder, if inadequately supervised, may facilitate infection. The health hazard from individual hens' eggs seems to be negligible, while that from dried egg powder is much more considerable. Investigations have shown that the drying during manufacture reduces the risk very much but does not eliminate it entirely, and there is always the possibility of infection after drying. A high standard of cleanliness and care in the factory is necessary, as are measures to exclude unsound eggs. A good deal is being done in this direction.

[1] *British Medical Journal*, 1944, **2**, 760.
[2] *Canad. J. Res.*, F., 1946, **24**, 77.
[3] Ibid., F., 1944, **22**, 48.
[4] *Publ. Hlth. Rep., Wash.*, 1945, **60**, 835.
[5] *J. Hyg.*, Camb., 1946, **44**, 342.
[6] Ibid., 1945, **44**, 179.

A COURSE IN CHILD WELFARE

Arguing that there is need for organized training for those holding responsible posts in connexion with the welfare of children of all ages up to 16, the National Council for Maternity and Child Welfare has now issued the second report of its group committee on the whole subject of "Training in Child Welfare."[1] It recommends what is, in effect, an advanced course of training in the care of healthy children for those "who do not want to nurse sick children and do not want to become teachers." The course recommended would, it is hoped, qualify students for higher posts in children's homes and nurseries or as inspectors and supervisors of such establishments, and also produce a supply of "fully qualified teachers and tutors in the welfare of children of all ages." Lest it might be thought that the main object is to create what the report at one stage terms a "new profession of child welfare," it should be stated that what is really essentially contemplated appears to be the training of teachers—a sort of "staff college" in child care and treatment—who can help in the broader and more important task of preparing and helping parents in the job of bringing up their children. Such preparation, it is argued in an introduction, can take place in three stages. The first should form part of general education in schools, and Part II of the present report deals in some detail with the question of instruction in child care in secondary schools and county colleges. The second stage of preparation appears to lie in such colleges and in youth organizations, and the third stage is summed up as making facilities for parentcraft freely available for adults in addition to the advice given to mothers in welfare centres and by health visitors. All this will require more teachers, and it is argued that to secure well-qualified persons it must be done by producing a new group—not by transfer from existing professions (teachers or nurses) with supplementary courses. It proposes that such teachers shall be trained in recognized colleges with a three-years course, and that "child welfare workers"—those wishing to take senior posts in nurseries or children's homes—shall go to the same colleges for a two-years course. It is further proposed

[1] 117, Piccadilly, London, W., price 1s.

that such colleges shall receive grants on the same basis as teachers' training colleges or domestic science colleges, with similar conditions in regard to inspection, entry, and grant aid for students. The content of the child welfare course is summarized as being based upon "the study of the child at successive stages in relation to the family, including the physical, mental, and emotional development." Special shortened courses of not less than six months are planned for those already trained in some allied profession such as teachers, health visitors, hospital nurses, and certain categories of social workers. It is also suggested that nursery nurses holding the national certificate and with not less than two years' experience of work with children shall have some reduction made in the length of course for the higher "child welfare" qualification.

This new report will be studied with interest by those concerned with the care of the child. The confusion occasioned by the title "child welfare" should be resolved, for "maternity and child welfare" is long established and has a definite meaning in medical and lay circles. There is also the fundamental difficulty to be faced that the supply of girls, whether for nursing or teaching or for this new "profession," is limited; and to talk, as this report does, in terms of "a great many additional teachers," fully qualified to teach child care, is to disregard the realities of educated woman-power in terms of numbers.

THE SANITARY CONTROL OF ICE-CREAM

That freezing kills bacteria is a fairly common misconception. Actually there is no better method of preserving their life for long periods: this is true at least of all those which enter the body by the alimentary route. Ice-cream will therefore contain in the living state the original flora of its ingredients, which may include pathogens if any cream or milk enters into its composition, and—which is more important—those introduced by insanitary methods of handling. Outbreaks of intestinal infection conveyed by ice-cream have been numerous, and regulations have been in existence for some years requiring the registration and inspection of premises used for the preparation of ice-cream. Unfortunately the resumption of its manufacture after the end of the war has been followed by an extensive outbreak of typhoid fever at Aberystwyth due to the contamination of his product by a vendor who is a urinary typhoid carrier. A similar incident has recently been followed by an equally extensive outbreak of paratyphoid B at Coatbridge in Lanarkshire. In view of these occurrences it was evident that further statutory precautions were required, and the Minister of Health has now issued a Draft Order (Draft, dated Oct. 8, 1946, of the Ice-cream (Heat Treatment) Regulations, 1946), the effect of which, in short, is that the mixture of which ice-cream is composed must be pasteurized before freezing. It may be heated either to 150° F. (65.5° C.) for 30 minutes or to 160° F. (71.1° C.) for 10 minutes. Further regulations govern the subsequent cooling process and the maintenance of a sufficiently low temperature thereafter. These requirements do not apply when a "complete cold mix powder" is used, supplied in air-tight containers and manufactured from previously heat-treated material: this may be made up with "wholesome drinking-water," and colouring or flavouring materials, fruit, nuts, or chocolate, may be added without subsequent pasteurization. In a Circular (183/46) of the same date the Ministry of Health calls attention to these draft regulations and points out that local authorities have already considerable powers in connexion with the manufacture and sale of ice-cream under the Food and Drugs Act, 1938, and refers to the possibility of defining bacteriological standards to which the product shall conform. Although it has been represented to the Ministry that laboratory tests of cleanliness are desirable the conclusion reached is that "no test has yet been devised of the safety of ice-cream, and there is no known test which would be sufficiently reliable for use as a statutory test of its contamination with non-pathogenic organisms." In the present state of knowledge of this subject it might well be premature to define statutory tests, but a very good idea of the hygienic quality of ice-cream can be obtained by performing a total bacterial count, a coliform count, and the identification of the coliforms as of excremental type or otherwise. The performance of some such tests on the future heat-treated product may also indicate whether the new regulations afford an adequate safeguard. The neglect of elementary precautions in handling and in ensuring the cleanliness of utensils may still presumably lead to serious contamination, if only on a reduced scale.

THE SPREAD OF POLIOMYELITIS

The mode of transmission of the poliomyelitis virus is a matter that is still unsettled. In the absence of definite knowledge whether the infection is conveyed by something inhaled or something ingested it is difficult to frame rules for prevention, and the account (Aug. 17, p. 233) we gave recently of precautions to be taken in the event of an outbreak naturally takes each possibility into consideration. One way of studying this question is by seeking to identify the portal of entry by histological methods. Neurotropic viruses are known to reach the central nervous system by way of peripheral nerves, and their pathways can be traced by the lesions, consisting of nerve cell degeneration and leucocytic infiltration, produced both in peripheral ganglia and in the related nuclei in the brain. However, in the case of the latter particularly it is always possible that involvement is the result of spread from a neighbouring area, and such findings have therefore to be interpreted with caution.

An elaborate and painstaking study of this kind is described by H. K. Faber and Rosalie J. Silverberg,[1] whose material consisted of eight fatal cases of poliomyelitis occurring in San Francisco during 1943–4. In no case was there any evidence of involvement of the olfactory system—an interesting result in view of the belief prevailing until about 10 years ago, and of the efforts made in the U.S.A. to prevent ingress by this route by tanning the olfactory mucosa. The sympathetic system in both lower and upper levels and the gustatory system were occasionally involved; the visceral afferent pathways via the ninth and tenth cranial nerves were markedly affected in three cases, as shown by lesions in the petrosal and nodose ganglions and the solitary nucleus; but the most consistently infected pathways were the trigeminal, lesions being found in almost every case in the Gasserian ganglia and their central connexions. This type of evidence therefore suggests strongly that the pharynx is at least a common portal of entry: as the authors point out, it is a receptacle both for nasal secretion and for material ingested. It is therefore as uncertain as before whether the mode of transmission is by ingestion or by inhalation.

The annual general meeting of the Research Defence Society will be held at 26, Portland Place, London, W., on Wednesday, Oct. 23, at 3.15 p.m., when Prof. N. Hamilton Fairley, M.D., F.R.S., will give the fifteenth Stephen Paget Memorial Lecture entitled "Wartime research in malaria and other tropical diseases of military significance."

[1] *J. exp. Med.*, 1946, **83**, 329.

IMPRISONMENT UNDER THE JAPANESE

BY

A. P. CURTIN, M.R.C.S.
Late Surg. Lieut.-Cmdr., R.N.V.R.

I read with interest the article by Capt. A. L. Cochrane (Feb. 23, p. 282) on the effects of the psychopathology of imprisonment of ex-prisoners of war from Germany. It may be of interest also to review the main underlying factors, and the background of events that caused them, which contributed to the mental state of prisoners liberated from Japanese camps. All the conditions mentioned by Capt. Cochrane as operating in German camps were present but to a more marked degree in prison camps in the Far East. Only the medical officer who actually had care of these men and shared in the trials, difficulties, and punishments of their daily life in captivity can thoroughly understand them. I write mainly from experience of conditions in work camps in industrial areas of Japan, such as Tokyo. They varied in degree, but in the main the general trend seems to have been the same in all of them. The prisoners included British, Australians, Americans, Dutch, and Eurasians, their ages varying from 15 to 60 years.

On arrival at the Japanese port prisoners were grouped into parties for despatch to different work camps in industrial areas. In most instances the officers originally in charge of the men in the field were separated from them and sent elsewhere, and other officers, very often of entirely different nationality, were appointed. As a result doubt and mistrust were engendered in the minds of the men whether their new officers would, in fact, take any interest in their welfare and would stand, so far as it was possible, between them and the brutalities of the Japanese. The policy of the Japanese was to maintain small camps of not more than 350 prisoners, so that a very close watch could be kept on them by frequent roll-calls and "shake-downs," in the early days even during the night. Escape was out of the question, even had it been possible for a white man to pass unnoticed in the streets in Japan; in fact, no thought of escape occurred to the prisoners in these circumstances.

Food and Clothing

Food was scarce and greatly lacking in essential proteins, fats, and vitamins. The staple diet was rice and root vegetables or soya-beans made into soup, with occasionally fish and seaweed and grass when nothing else could be had. It never averaged more than 1,500 to 2,000 calories a day for the working men. On certain details—e.g., unloading box cars at a railway siding—the men were able to supplement their rations by stealing. This was also practised by the Japanese and seemed a habit in Japan in all branches of industry; indeed it appeared to be necessary for survival. Undoubtedly it was by this means that many prisoners held on to the threads of life, especially during the winter months. The motto was, not to get caught by the Japanese guards, or, failing this, if possible to come to some sort of compromise by giving them a part of the stolen food or loot. Punishment meted out to prisoners who were caught with stolen goods was severe and ruthless.

Many prisoners made small articles such as rings, belt buckles, etc., at the factories for the Japanese bosses, for which they were paid in rice and cigarettes. Red Cross parcels were few. Most camps received only three or four per man throughout the 3½ years. When, however, Red Cross food had been distributed stealing among prisoners themselves greatly increased. The sick had the same fare as those going to work, and it was difficult, at times almost impossible, to coax them to eat the unpalatable diet and to prevent them from giving part at least of their food away to other prisoners, many of whom in their state of hunger befriended the sick only to steal or be given their rations.

It was noticeable that while the men were kept in a state of semi-starvation sex presented a very minor problem and homosexuality was practically non-existent, except possibly in the galley, for the cooks always managed to supplement their rations. Sex talk and homosexuality were always likely to arise with any improvement in the rations.

The lack of clothing, particularly warm clothing, was responsible for a good deal of sickness during the winter months. In the early days men waited to take the garments of the dying for themselves, as they were in rags. In wet weather clothes had to dry on their owners, as each man had but one set. Only in the first winter of 1942–3 was any heating provided in the barracks. Many men were without shoes and had to go to work with sacking tied round their feet or in wooden clogs. Another problem was the struggle to keep clothing reasonably free from lice, which abounded. Bed bugs and fleas were everywhere and huge rats ran riot at night in the camp. In winter, because of lack of blankets, the men were allowed to sleep in pairs to conserve as much warmth as they were able.

Tradition of Punishment and Work

Although the Japanese record is lightened by deeds of kindness extended to captives by individuals, the military and the police had been following their own vaunted tradition and practices reaching back to the primitive ages. Their motto for prisoners was that good workers have good spirits, and this was based on a continuous litany of work and punishment. Fear of the latter was constant among the men and became to them a very real thing. Officers were treated the same as the men; there was very little discrimination. Most of the maltreatment of prisoners seemed to be carried out by the Gunzakus, or so-called civilian division attached to the army, who nevertheless wore military uniform and carried side arms. Punishments, which were inflicted for little or no excuse, included severe beatings, standing to attention in the open in all weathers for long periods, and solitary confinement. The severity of the punishment varied with the mood and particular tantrum of the Jap concerned at the time. Often it would result in black eyes, broken ear-drums, laceration of the scalp, broken ribs, etc. Prisoners' teeth were knocked out, the Japanese using their fists, leather or wooden shoes, belt buckles, and wooden swords.

The type of work varied according to the different working parties, some having relatively light work compared with others. Much of it, however, was particularly unpleasant and detrimental to the prisoners' health—e.g., work on crushing machines in a brick factory; shovelling coal, iron ore, copper ore, etc., in the closed-in holds of a ship where the concentration of dust and particles of the mineral was choking. Despite protests about employing men in this type of work very little notice was taken, and the more unpleasant forms of labour to which even the Japanese coolies objected were inevitably allotted to the prisoners. The average daily hours of work were from 7.30 a.m. to 5.30 or 6 p.m. Some parties had considerable distances to walk to and from work.

The Japanese tried many and varied devices to get as many men as possible out to work. They beat them, making life as unpleasant as possible for the sick in camp so that they wanted to go out to work at any cost to avoid this persecution. Then, by supposed order from Tokyo Army H.Q., all sick men, even the factory injured cases, were ordered to go on half rations, and, as men unable to work, they were not allowed to buy or to receive extra comforts, such as cigarettes or cookies when they were available. The very few Red Cross food parcels were allocated to working men only. Many of these devices, fortunately, were cunningly overcome in one way or another, and so failed to achieve their desired object.

It was a long time before a regular day off (and then only one day a month) could be obtained for the working men in order to give them a chance of a rest and to wash and mend their clothes. Another concession eventually obtained in some camps was that men over 50 years of age were not employed on heavy work, only on cleaning the camp or other light work. There was a vicious competition between commandants of the various work camps in the industrial areas to see who could maintain the highest working percentage. One of my camp commandants during the period he was with us devoted the whole of his time to compiling work graphs of different camps in the area, and the walls of his office were covered with them. Prisoners were made to work as stevedores at night if the company concerned presented the camp commandant with a gift of "saké" or beer so that he could hold a drunken party for the camp staff.

Only a very few sick men were allowed to be left in camp during inspections by Japanese Military Staff from Tokyo. The others were hidden somewhere in the camp compound or, if they couldn't walk, were carried out to work by their friends and hidden in some part of the factory. In this way an entirely false picture of the sickness in the camp was presented. The food improved somewhat on inspection days, but these were not very frequent. Extra clothing was also issued occasionally but had to be turned in again after inspection. Needless to say, no communication was allowed between officers among the prisoners and the Japanese visiting military staff.

Medicines and the Sick

Medicines were most difficult to obtain. The Japanese medicine "black market" was flooded with cheap German products, mostly made up in ampoules to be given by injection. If there happened to be a useful drug in some of these preparations the quantity was so small that the preparation was relatively ineffective in the dosage prescribed on the label. Most of the medicine used in camps was bought with the pay given to the officers by the Japanese and obtained through the "black market." Allocation of medicine and medical supplies by the Japanese Army H.Q. to work camps was totally inadequate, and most of this was stolen or used by the Japanese staff for their own purposes. Much of the surgical gauze appeared to find its way eventually to the geisha house, although for what purpose I was at a loss to determine.

Latterly many Japanese factory workers suffering from the effects of malnutrition were regularly treated with the needle by the Japanese factory doctor, preparations labelled "arbeithormone" and others being given which supposedly stimulated the output of an individual. Many types of "ovarian hormone" preparations were prescribed for women workers. When obtainable, which was seldom, aspirin cost 1 yen or 1s. 6d. a tablet. Great care had to be exercised in the administration of Japanese sulphonamides because of their toxic effects. Much of the Red Cross supplies of drugs and medicines was withheld by the Japanese from distribution to work camps; even major operations had to be performed without anaesthetics of any kind. There was no proper hospital to which seriously ill prisoners could be sent when necessary. The presence of seriously ill and dying men in a work camp tended to lower morale a good deal, but the men were terrified of going to a Japanese hospital, nor indeed would the Japanese ever have considered sending them there unless they were on the road to recovery first. Prisoners went in constant fear of being treated by Japanese Army doctors and medical staff, as reports and rumours of their treatment of prisoners were so bad.

From November, 1944, onwards Allied air raids began in earnest in the Tokyo area. This caused grave anxiety, constant nervous tension, and loss of sleep at night among the prisoners, as many camps were in the target area. In spite of repeated requests it was only in the last four months of the war that any dispersal of prisoners outside the camp compound during a raid was allowed. Before the end of the war my particular camp had been completely wiped out by a concentrated night raid with H.E. bombs on surrounding industrial targets.

Disease Conditions

The effects of beriberi varied in degree; both wet and dry forms were prevalent. In some cases it was associated with amblyopia, central scotoma, and contraction of the visual field probably resulting from the effects of retrobulbar neuritis. Some prisoners manifested signs of posterior column dysfunction progressing to a severe degree of ataxia and peripheral neuritis. The mental condition of these men deteriorated and they became dull and apathetic. Dysentery, both amoebic and baciliary, was prevalent. Pulmonary tuberculosis began to manifest itself in a very short time. During the winters of 1942 and 1943 severe pneumonia was prevalent, especially among prisoners recently brought to Japan from the Tropics. Many of these cases were also complicated by recurrent malaria and resulted in a terminal delirium.

Staphylococcal and streptococcal infections of the skin, boils, carbuncles, etc., in all parts of the body were very common. Owing to the weak musculature of the abdominal wall and pelvic floor there were many cases of haemorrhoids, hernia, and even rectal prolapse among the working prisoners. The heavy work was conducive to inguinal hernia. The shovelling of lime produced lime burns of the skin and eye. Arc-welding torches were used by prisoners without any protective goggles, and injuries to the eyes by flying hot metal chips were common, resulting in some cases in severe injuries to the cornea.

Men working in the factories tended to become accident-prone, largely due to fatigue and weakness, and at periods "black-outs" occurred. Many accidents, some of a serious nature, were caused by faulty machinery—for example, burns of the skin and feet due to leaking overhead lead pipes carrying acids or alkalis. Septic infections of the hands from either mild or severe trauma were frequent. At times, in order to get a few days' rest from work, a prisoner would intentionally try to get an injury of a minor nature, but sometimes this proved dangerous and a more serious condition resulted. One prisoner had his right hand and forearm torn and crushed in a brick machine in this manner: another a traumatic amputation of two toes and part of his right foot. Lack of clothing resulted in various ailments—influenza, pneumonia, frost-bite, conditions of trench-foot and gangrene of the toes in some cases. Many men were successful in deceiving the Japanese by feigning a greater degree of sickness than they actually suffered in order to avoid work.

I should like, in conclusion, to add my plea to Capt. Cochrane's that more attention should be paid to the psyche of repatriated prisoners.

THE ROLL OF MIDWIVES

The Central Midwives Board for England and Wales, in a report for the year ending March 31, states that on that date the roll of midwives contained the names of 72,248 women, being 1,653 more than at the end of March, 1945. But this figure must be regarded as inflated because since 1938 the Board has not taken action to clear the roll by removing names of midwives from whom no reply has been received within six months. The number of midwives who notified their intention to practise during 1945 was 16,680, being 306 more than in 1944. Only three of these were untrained *bona fide* midwives, that is to say, enrolled by virtue of having been in *bona fide* practice before the passing of the Midwives Act, 1902. The Board has records of the ages of over 90% of practising midwives, and of this number 62% were aged between 27 and 47 years, and nearly 7% were under 27. The median age is between 38 and 39. There has been an increase of 815 in the number of pupil midwives entering first-period training schools during the last year. Only six penal cases were inquired into during the year, and only two names were removed from the roll. At the date of the report 148 training schools had been approved for courses for training midwives in the use of analgesics.

MEDICAL DEFENCE UNION

The annual meeting of the Medical Defence Union was held at its offices, 49, Bedford Square, W.C.1, on Sept. 24, with the President (Mr. St. J. D. Buxton, F.R.C.S.) in the chair.

Mr. Buxton said that the Union had now passed its sixtieth birthday, and it was hoped to be able to publish a history of its progress. Throughout these years there had been a steady increase in the work the Union was called upon to do on behalf of practitioners. The cost of litigation, both defensive and offensive, had also increased. It was the object of the Council to assist members by teaching and warning and by the publication of particular cases. Nevertheless, the frequency of similar cases was noteworthy, suggesting that warnings had not always been taken to heart. It was anticipated that the National Health Service when it was constituted would open up new problems. The Union was determined to keep itself abreast of the times and to intervene wherever necessary to protect the interests of the profession and its members, though the Union, of course, limited its activities to professional matters and did not embark upon political ones.

Mr. Buxton was unanimously elected again to the presidency of the Union. Dr. Henry Robinson was re-elected treasurer, and Dr. R. Roche Lynch, chairman of the council committee. The retiring members of Council, Mr. Buxton, Dr. Janet Aitken, and Dr. Peter Macdonald, were also re-elected. Dr. Clark Trotter expressed the thanks of the members to the Council and the secretary (Dr. Robert Forbes) and commended the way in which the Union had grappled with war difficulties.

The Annual Report

The annual report and statement of accounts, which was adopted at the meeting, stated that the total membership of the Union was now just upon 30,000. During last year the cases conducted by the Union numbered 1,179. A note appears in the report on the reinstatement of practitioners returning to civil life. A number of members had inquired concerning their legal rights of reinstatement in hospital or other appointments held by them at the time of their recruitment to the Forces. The position of demobilized practitioners was governed by the Reinstatement in Civil Employment Act, 1944, but an important factor governing the situation was that the practitioner must have occupied a post carrying pay directly related to the value of the services rendered. This provision stopped many practitioners whose hospital appointments were honorary, and some governing bodies of voluntary hospitals had refused to reinstate returning consultants and specialists, arguing that the posts were now held by other practitioners. This was contrary to the spirit of the Act. The same resistance had not been encountered by occupants of posts in municipal hospitals, partly because these were paid appointments, and partly because the operation of the Act applied to the whole municipal staff. Members whose legal rights were disputed could receive immediate help from the Union, but those whose previous hospital appointments had been honorary must depend largely upon the discretion and good will of the governing body concerned.

On the question of the impending National Health Service, the report refers to a feeling of anxiety among a number of practitioners as to the possible abrogation of partnership and assistantship agreements and the loss of the protection that principals have hitherto enjoyed by virtue of the restrictive covenants into which their assistants and colleagues have entered. It is also pointed out that a considerable section of the profession will be brought for the first time into contact with rules and regulations of which they have had little or no previous knowledge, and difficulties are bound to arise. The Union is preparing itself adequately to meet these novel situations, and has appointed an *ad hoc* committee to watch the progress of the Bill so that proper advice and assistance would be readily available when required.

The report also contains a note on the successful prosecution of unqualified persons, a reference to a new code of practice for anaesthetists, a summary of cases fought on behalf of practitioners during the year, and some comments by the solicitors (Messrs. Hempson) on legal points which have arisen.

Reports of Societies

THE PROBLEM OF DISSEMINATED SCLEROSIS

In his presidential address to the Section of Neurology of the Royal Society of Medicine on Oct. 3 Dr. DOUGLAS MCALPINE dealt with the problem of disseminated sclerosis. No neurological disease, he said, had until recently had so much attention from clinicians, pathologists, and bacteriologists, yet its true nature still eluded them. This subject ought to be reviewed once again in the hope of arousing fresh interest in a problem which, on humanitarian grounds alone, deserved the attention of those qualified to take part in its investigation.

Aetiology of the Disease

The term "disseminated sclerosis" was inadequate because it failed to describe either the essential nature of the disease or the type of initial lesion. Dawson, in considering the various possibilities, concluded that disseminated sclerosis was due to a specific morbid agent, probably a soluble toxin, which was conveyed to the nervous system by the blood, and that the occurrence of remissions and relapses compelled the assumption of the morbid agent in the body. No worker had produced evidence to contradict the conclusion that disseminated sclerosis was a form of acute or subacute disseminated encephalomyelitis due to a blood-borne infection. Russell Brain, in a critical review published in 1930, discussed the various attempts made during the first part of this century to isolate a specific organism from the nervous system in fatal cases and to transfer the disease to animals, and he showed that these attempts had either failed or had been inconclusive. Repeated failures to transmit the disease to animals had caused renewed doubt about its infective nature. In America Putnam concluded that venous thrombosis was the essential histological lesion, but it was doubtful whether the results of Putnam's work could be applied to the problem of disseminated sclerosis, and it was difficult to visualize thrombosis as the primary lesion in view of the clinical fact that the duration of symptoms might be exceedingly brief. On the other hand, there were facts which suggested that the vascular mechanism might occasionally come into play.

There remained for discussion, said Dr. McAlpine, two further lines of approach which were interrelated: (1) that allergy might be a factor in disseminated sclerosis, and (2) that the disease might be caused by a bacterial agent or by a filter-passing virus. There were certain features of disseminated sclerosis, notably the relapsing nature of the disease, which could be explained on the basis of allergy, but at present further speculation on this point would serve no useful purpose. Efforts made by the bacteriologist to establish the nature of the causal agent had up to the present failed. While final judgment must be reserved on the possible role of a toxin, these negative findings seemed to point to a filter-passing virus rather than to a bacterial agent. This was perhaps borne out by some recent work in Moscow, not yet published in this country, which claimed the first success in isolating a virus from a human case and the production of the disease in animals. The further results of this work, which was still being pursued, would be awaited with great interest.

If it was assumed that disseminated sclerosis was toxi-infective in origin, there remained for consideration the mode of infection. At the beginning of this century attention was focused on the peripheral nervous system as the probable route. More recently the experimental work on poliomyelitis in monkeys had suggested that in these animals the virus travelled via the axis cylinders. After discussing various theories Dr. McAlpine considered that there was good evidence to support the view that from a focus in the skin bacteria and their toxins or a virus might reach the nervous system either by neural pathways or by the bloodstream.

The Clinical Approach

In discussing the clinical approach to the problem Dr. McAlpine limited himself to those features of the disease which seemed to throw some light on its causation. Unlike the majority of organic nervous diseases, disseminated sclerosis was distinguished by the remarkable variation in its clinical course. Remissions might last for more than ten years or for less than six months. The degree of recovery might vary within wide limits. For example, the disease might appear in a florid form, but despite the multiplicity of signs, good clinical recovery and lengthy remission might follow. Age modified the course of the disease. The older the patient the more localized were the signs and the more chronic the course. When the disease first attacked an individual in the fifth decade of life the remissions were as a rule inconspicuous, the disease tending to run a slowly progressive course interrupted by short periods of arrest. The florid form of the disease was seldom seen outside the younger age groups.

Despite its protean nature, the disease had been recognized by the clinician and the pathologist as a clinical entity, though the term "disseminated sclerosis" might cover more than one type. The peculiar nature of the disease could be explained in terms of the patient or of the agent. As there was no precise knowledge of the character of the agent, it might for the moment be assumed that the reactions of the individual to the disease were the prime factor in modifying its course. It could be inferred that the clinical features of disseminated sclerosis were in all probability the result of an immunity to infection which varied not only from case to case but also during the course of each patient's illness. In conjunction with the abnormal findings in the cerebrospinal fluid, this view lent support to the theory of a toxic infection. If it was assumed that this infection was due to a virus it would be necessary to broaden their views as to the symptomatology of the disease and to recognize the existence of sub-clinical forms.

A Survey of 124 Cases

Dr. McAlpine showed a table indicating the age of onset and the sex incidence in relation to two common types of disseminated sclerosis as observed in 124 cases during the past year. The number was too small for statistical value, but certain facts seemed to emerge.

Age Group	Relapsing		Chronic Progressive		Percentage
	M.	F.	M.	F.	
10–20	8	10	—	—	14·5
20–30	18	32	—	—	40
30–40	12	19	3	4	31
40–50	1	6	3	6	13
50–60	—	—	—	2	1·5
	39	67	6	12	

In this country it was generally held that the disease was more common in females, and the above series, though small in number, seemed to bear this out, more particularly in regard to cases in the fifth decade. In other European countries and in America either males predominated or there was no significant sex distribution. Occupation appeared to play no part in causation. Both urban and rural dwellers might be affected. There appeared to be no seasonal incidence in this country. The number of authenticated cases of familial disseminated sclerosis was not large, but there could be no doubt that the disease might attack more than one member of a family. Out of a total of 142 cases (124 of which appeared in the above tabulation) there was a familial incidence in 8 (5%); in 6 the disease affected siblings, and in one case the father and in another the mother of the patient had been affected. This familial incidence seemed to indicate an occasional hereditary predisposition to the disease, and in this respect the position might be compared with tuberculosis.

No distinctive type of body build or colouring seemed to be associated with the condition, though obesity appeared to give some protection. Approximately 20% of the patients in the series stated that they felt run down before the illness began. In 71 cases an approximate idea of the diet had been obtained, but only in 10 were meals ascertained to be irregular or deficient in quantity, and in no case was there evidence of malnutrition. The impression obtained was that the individual when first attacked was generally in good health, though in a minority some interference with health or with diet might have lowered the resistance. In only 8 cases was there a history of any fever—usually described as "influenza"—within a month

of onset, and in only 5 other cases a history of "cold and sore throat" without fever. A positive history of peripheral sepsis within one year of the onset was obtained in 18 cases. The known bacteria associated with sepsis might play no direct part in the causation of the disease, but the possibility of secondary virus infection was not excluded.

Conclusions

Dr. McAlpine summarized his conclusions as follows:

Inheritance plays only a minor part in the aetiology of disseminated sclerosis, and therefore the choice seems to lie between biochemical or enzymic abnormality, of which proof is so far lacking, and, on the other hand, a toxi-infective process. Increasing knowledge of the various forms of encephalitis in man and animals and the part played by viruses in certain of them, when viewed against the histological background of disseminated sclerosis, suggests that this disease is also infective in origin. The results of the clinical approach bring to light no facts which are contrary to this view and some which seem to favour it. With the exception of cases in which there are influenza symptoms, the onset of the disease is not generally accompanied or preceded by constitutional symptoms. The possibility then arises that invasion of the nervous system and the appearance of the first sign of the disease may not always coincide in time, but that the former may take place months or years previously, as in rabies or syphilis. At what point in the patient's life history did the nervous system become infected or sensitized? In this inquiry there was no answer to that question.

Attention was next turned to the portal of entry of the hypothetical agent or toxin, and by analogy with other infections of the nervous system it was inferred that the skin and the alimentary tract were the likeliest starting-points of the invader. From our knowledge of the histology of disseminated sclerosis it was necessary to postulate a haematogenous spread from the focus. The evidence in favour of the skin as an occasional portal of entry in disseminated sclerosis is purely circumstantial, but it seems to warrant further exploration in view of the part played by the skin in other infections of the nervous system. The remaining portal of entry is the alimentary tract. Should disseminated sclerosis prove to be of virus origin, then, by analogy with acute poliomyelitis, the alimentary tract becomes a potential source of infection. The fact that a history of intestinal disorder is rarely found in these cases must not be regarded as a reason for dismissing that possibility. The proof of a virus infection, whether by direct or indirect means, would be of the greatest help to future progress in our knowledge of the disease and its treatment, and there is urgent need for carefully planned research work based on the close co-operation of the clinician and the bacteriologist.

Sir CHARLES SYMONDS, in proposing a vote of thanks for the address, congratulated the President on his choice of subject. There could be no problem which so often excited the curiosity of the neurologist and so constantly left him in a state of despair. The vote of thanks was seconded by Dr. ANTHONY FEILING, who said that the President had given a masterly survey of the subject, with some very valuable hints as to the possible future approaches to the aetiological problems.

ELECTROENCEPHALOGRAPHY

The autumn meeting of the Electroencephalographic Society, held at the Maudsley and Runwell Hospitals on Oct. 4–5, was attended by a number of European workers, including Professors Baudouin, Colle, Fessard, Frey, and Monnier.

In opening the meeting, the President, Prof. E. D. ADRIAN, said: "Apart from the value of the contributions which they are able to make to this meeting, the visit of our European colleagues has a more important significance in that it enables us to confer on the standardization and interpretation of results and to agree on the various criteria which we all have to apply in the interpretation of records. If we are to attempt to bring electroencephalography to an exact science, it is essential that we formulate common standards and common terms which will form the basis of an international E.E.G. language."

Among the papers read were: "A New Six-channel Electroencephalograph," W. A. Cobb; "An Electronic Analyser for E.E.G. Recording," W. Grey Walter; "The E.E.G. in Psychopathic States," J. D. N. Hill; "The E.E.G. after Pre-frontal Leucotomy," G. D. Greville and R. Ström-Olsen; "Cortical Correlates of Sensory Stimulation in a Patient with Myoclonus," G. D. Dawson; "La Première Réunion d'E.E.G. de langue française," A. Baudouin. Arrangements are being made for the publication of these papers in appropriate journals where possible.

Correspondence

R.M.B.F. Christmas Appeal

SIR,—Christmas once again draws near and it is time to ask the hospitality of your columns to launch our Annual Christmas Appeal on behalf of the poor beneficiaries of this Fund. The reasons for this appeal are now well known to all your readers and there is no reason to stress them again. I would rather emphasize the point that they are as cogent as ever. It is true that the Old Age Pension which is now in force, while making the financial position of old people more bearable—whereas previously it was quite intolerable—still means that the actual increase in annual income is only £41 12s. 0d. which, bearing in mind the tremendous increase in the cost of living, still makes the position of the poor housewife very difficult indeed. Further, very many of our beneficiaries are under 70 years of age and so not able to draw the O.A.P. Lastly there is that very real sense of being "not forgotten" at the festive time of Christmas, and the knowledge that our Christmas Gift will ensure the purchase of a few extra luxuries which just make all the difference.

I recall that my appeal last year for £2,000 to enable the Fund to give £4 to every beneficiary—a record sum for which I scarcely dared to hope—actually reached the grand total of £2,127, and I know every generous donor will feel amply repaid by the gratitude and pleasure these gifts evoked. May I venture to plead for a similar sum this year? I feel sure that, although I well recognize that times are very difficult for everybody just now, the still greater difficulties and anxieties of our very poor brethren will not pass unheeded.

Please forward contributions marked "Christmas Gifts" to the Secretary, Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, who will gratefully acknowledge.—I am, etc.,

ARNOLD LAWSON,
President, R.M.B.F.

Classification of Psychological Disorders

SIR,—Sir Charles Symonds (Sept. 21, p. 436) has effectively drawn attention to the lack of necessary discrimination between the terms Dr. Dalton Sands employs in his article on "Electroconvulsion Therapy in a General Hospital" (Aug. 31, p. 289). He uses, for example, "anxiety state" and "anxiety neurosis" without definition or a distinguishing description of the conditions referred to. In particular it should be recognized that "anxiety," which enters so frequently into Dr. Sands's tables, is not a simple unit factor. It is, as commonly found, a complex reaction which may include elements of guilt and tension from aggressive impulses, for instance, apart from pure anxiety.

The article provides another illustration of the fact that statistical studies on psychiatric disorders, in the present state of knowledge, are very apt to be misleading unless it is made clear that the conclusions drawn merely indicate tendencies and do not constitute a positive addition to knowledge.—I am, etc.,

London, W.1. FREDERICK DILLON.

Errors in Regard to Goitre

SIR,—The article entitled "Some Vulgar Errors in Regard to Goitre" by Linnell, Keynes, and Piercy (Sept. 28, p. 449) was indeed refreshing to read, after the recent spate of literature on the medical treatment of thyrotoxicosis with thiouracil. It is not my intention to attempt to enter into a debate as to whether treatment will eventually displace surgery in the treatment of toxic goitre, except to say that at least surgical procedure has stood the test of time. I would wish to comment briefly on some of the points raised in the article. Surgery is the only safeguard and prophylaxis against the later changes which may take place in a goitre, and operation is thus the means of preventing much ill-health and suffering. There is also the cosmetic aspect, as most women are worried about an obvious swelling, the days when "Rossetti" necks were the fashion having passed.

The indiscriminate use of iodine cannot be too strongly condemned. Not only is the patient buoyed up with false hopes,

but he is ultimately left in a far worse condition for radical surgical treatment or for the administration of thiouracil. The profession should in my opinion avoid using iodine altogether, except as part of the preparation for operation. The late Cecil Joll, whom I assisted for many years, strongly deprecated its all too common and thoughtless use. To embark on thyroid surgery without serving a long apprenticeship is wrong, as the hazards encountered are many. Joll himself often said that he assisted at some thousand-odd operations for goitre before undertaking one himself. Linnell *et al.* rightly consider the importance of good anaesthesia, without which the operation may be one of extreme difficulty in the most capable hands. All would-be thyroid surgeons should not fail to read Rowbotham's book *Anaesthesia in Operations for Goitre* (Blackwell, Oxford, 1945), for therein lies much sound guidance and wisdom. Lastly the co-operation of physician, surgeon, ear, nose, and throat surgeon, and anaesthetist is the ideal before the final decision as to the best form of treatment is made.

Let us not forget that many thousands of sufferers from goitre and its complications have obtained lasting relief from a well-planned and skilfully executed operation.—I am, etc.,

Aylesbury. RALPH H. GARDINER.

Treatment of Ingrowing Toe-nail

SIR,—The operation for ingrowing toe-nail described by Dr. J. Hume Stewart (Sept. 7, p. 329) is ingenious. And that seems to me to be its fault. It is too complicated and ingenious an operation for a minor disability, involving as it does a minimum of seven days in bed for the patient. Furthermore, the cosmetic result is obviously not perfect.

In my own experience the simplest and most satisfactory procedure is that described by Dr. P. F. Chapman (*British Medical Journal*, 1934, **2**, 1073). This consists in paring a groove down the centre of the nail with a piece of broken glass. The groove then forms a hinge on which the affected side of the nail is lifted up so that it comes to lie above the granulation tissue. A small strip of petroleum jelly gauze may be packed under the nail. Since 1938 I have made use of this operation exclusively in all cases of ingrowing toe-nail that have come under my care both in civilian and in military practice. A soldier may be allowed three or four days in hospital, but a civilian, with his wider choice of foot-gear, may be treated as an out-patient and has no need to lie up. Chapman's operation is so simple, so satisfactory, and at the same time so little known—none of my surgical colleagues in the Forces to whom I introduced it had heard of it—that I hope these few words in its favour will not be thought out of place.—I am, etc.,

Southwold. J. C. LEEDHAM-GREEN.

Is Thiamine the Antineuritic Factor?

SIR,—As one who has followed with deep interest the many reports now available on the deficiency states affecting the prisoner-of-war in the Far East—an interest naturally stimulated by one's own investigations of nutritional retrobulbar neuritis in Nigeria before the last war—I am tempted to ask now how far we are justified in still calling thiamine the antineuritic factor.

In West Africa in 1937, when I returned to Nigeria after my retirement from the Colonial Medical Service, I carried out an extensive series of trials with autoclaved marmite, in high dosage and over a period of months in each case, on this visual condition, with the object of excluding thiamine as a curative factor. I would mention that in all these cases routine ophthalmic tests (excepting scotomata tests) were always done to exclude other disease and gross refractive errors in order that one might be certain one was dealing only with a nutritional defect. The result of these trials convinced me beyond doubt that the curative factor was attributable to the autoclaved marmite or yeast, and not therefore to thiamine.

The opinions of those medical officers sharing captivity with the P.O.W. case has confirmed this in another way, for they have shown that thiamine did not protect these men from this condition. Nor do they accept beriberi clinically as the cause. No one, I think, disputes thiamine as the antiberiberi factor, and indeed the recorded experiences of these medical officers referred to fully confirms its effect on *wet* beriberi.

Research references to beriberi in this country, before the war, have appeared simply to accept this disease as the only one which could occur following a rice dietary. Yet, as has been so amply demonstrated by the P.O.W. case, and in Madrid, a multiplicity of B deficiency states can be produced. There have, however, been a number of research nutritionists who disputed whether thiamine is, in fact, a true organic neuritic factor; and most of them agree it is not concerned with central neuritides. Vedder, in 1943, has shown the danger of accepting rice as merely deficient in Vitamin B_1. He has quoted Ackroyd's work as well as his own, and he considers that the clinical picture of *dry* beriberi as it occurs on a rice-eating diet, with its nerve and cord degeneration, is caused by a complicated vitamin deficiency. It seems obvious that the so-called polyneuritis of chicks is hardly a true neuritis, with their sudden recovery when given thiamine. Elvejehm (Eddy and Dalldorf's, *The Avitaminoses*) has suggested it is primarily a condition of disturbed carbohydrate metabolism rather than lesions of the nervous system. It is certain that other vitamins than B_1 play a most important part in these neuritic conditions, and definite proof of this has been forthcoming. To continue to accept thiamine as *the* antineuritic factor seems, therefore, hardly tenable in the face of such evidence.—I am, etc.,

Cheltenham. D. FITZGERALD MOORE.

Diagnosis of Intestinal Amoebiasis

SIR,—I have yet to see in recent accounts of amoebiasis a mention of the use of "provocative emetine" as an adjunct to diagnosis. Such a method was generally well known in the Services and in many cases was used as routine in suspect but unproven cases. The method consists of the administration of emetine hydrochloride 1 gr. (65 mg.) intramuscularly—or emetine bismuth iodide 3 gr. (0.2 g.) orally—the night previous to the faeces examination. The following morning a purge is given and the stools examined by the usual methods. The effect of the emetine is provocative or stimulatory to the trophozoite, with the result that a patient suspected of latent amoebiasis and producing a series of negative stools may well produce an immediate positive result.—I am, etc.,

Newcastle-upon-Tyne. K. R. HILL.

Penicillin Injections

SIR,—I was under the impression until recently that when giving penicillin injections the syringe should be sterilized by boiling or autoclaving, as spirit would inactivate the penicillin. However, Prof. Berry, in Sir Alexander Fleming's book on penicillin (p. 50), says that penicillin is not inactivated by solutions of ethyl alcohol up to 25%. In general practice it wastes a lot of time to boil the syringe each time, and I am now using syringes sterilized in 70% industrial spirit. The solution of penicillin as made up with sterile water or saline would only contain a trace of alcohol—certainly nothing approaching 25%.

Regarding the oily injection of penicillin, I would be interested to know how quickly a trace of water in the ampoule causes deterioration in the bulk of the penicillin left. If this deterioration takes several weeks, one would not need to be so very careful about drying the syringe used to withdraw the separate doses, provided the ampoule was used within a week or two.—I am, etc.,

Bristol. P. FINCH.

Perforation of the Ileum in Enteric Fever

SIR,—With reference to Dr. G. E. Dunkerley's article on "Perforation of the Ileum in Enteric Fever" (Sept. 28, p. 454), I had the unusual experience of encountering two such cases within two weeks in a small epidemic of six cases seen at a military hospital in M.E.F., and append very brief clinical notes which may be of interest.

This first man had been ill five weeks with typhoid and was in his second relapse and had been complaining of acute abdominal pain for sixteen hours. On examination he was a patient *in extremis* with generally rigid and tender lower abdomen and cold extremities. At operation the pelvis was full of purulent fluid and the ileum, some two feet from the ilio-caecal valve, showed perforated ulcer with protruding

slough. Recovery followed suture with pelvic drainage and careful post-operative treatment including continuous gastric suction, adequate intravenous fluid therapy, and regular morphine.

The second man was in the second week of illness and was seen half an hour after the onset of violent lower abdominal pain. On examination he was writhing in pain with the knees drawn up, tender in both flanks, and showing marked rebound tenderness in both areas. There was no true rigidity, but a somewhat surprising finding was the hearing of vigorous audible peristalsis. Half an hour later he developed definite localized rigidity in the right iliac fossa. Laparotomy was not delayed and suture of a friable perforation one foot from the ilio-caecal junction was undertaken and omental graft brought down. A considerable quantity of clear fluid was sucked from the pelvis, and abdomen was closed without drainage. The lower end of his wound suppurated and a large pelvic abscess developed, both conditions slowly resolving in three weeks. He then proceeded to have a relapse of his typhoid fever, which happily was an uncomplicated course.

The unusual features were the very high incidence of perforation in this small epidemic, and the rather surprising recovery of the first case, which might suggest that this complication, especially if diagnosed early and given adequate surgical care, is not so lethal as hitherto supposed.—I am, etc.,

London, N.21. W. GARDEN HENDRY.

Giant Urethral Calculus in the Female

SIR,—With Mr. Norman Lake's article in the *Journal* of Sept. 7 (p. 328) fresh in my mind, I went the following morning to see an old lady of 70 in consultation, with Dr. Charles Sims of Exeter. Apart from the patient being somewhat older, her symptoms and physical signs closely resemble those described by Mr. Lake. The calculus, after removal in the manner Mr. Lake describes, measured 6.7 × 4.6 cm. with a circumference of 17.7 cm. in its long axis. Its colour and somewhat irregular surface closely resembled that of a potato.—I am, etc.,

Exeter. P. M. G. RUSSELL.

Health Service Bill

SIR,—From its inception I have been opposed to the National Health Service Bill as I consider that it interferes too seriously with the responsibility and liberty of the individual doctor, which is such a strong factor in the safety of the patient. Study it as I may, I cannot see in what way the State medical service Bill improves so much upon the existing medical services as to warrant this sacrifice. Further, are the existing medical services so bad as to merit the expenditure of so much time in Parliament and of public money upon this State medical service during these critical years? Surely to an honest observer the reply must be in the negative. One is forced then to conclude that the State medical Bill is no health measure at all but a political measure.

I could not agree more completely with Dr. Sybil Tremellen and Drs. Zoë and Paul Harris in their letters (Sept. 21, p. 439). Medical practice is my life, but I will not enter this State medical service; and if I can then no longer make a living as a medical practitioner I shall have to find something else to do. It would be far more difficult for me to make this decision had I a wife and young family or any other dependants to support; but it is my considered opinion that if we English men and women do not now, and at every similar issue, refuse to yield right to expediency, we shall find too late that we have sold our birthright for a mess of pottage, and that we are treading the road the Germans trod.—I am, etc.,

Walton-on-the-Hill. URSULA M. DICK.

SIR,—Dr. Peter Waddington (Oct. 5, p. 515) charges me with lack of political insight in comparing Socialism with Nazism. As a matter of fact my letter made no such comparison. What I did contend was that the surrender of individual thought, and a blind acceptance of whatever thinking the State chooses to do, were the attitude of mind which led to the Nazification of Germany, which is a very different matter. He suggests that I deplore the fact that a Labour Government was returned to power by less than one-half of the electorate, whereas what I actually do deplore is the nauseating attitude taken up by so many Socialists that they have an overwhelming mandate from the country when, in fact, they have not. Dr. Waddington queries my suggestion that the Bill gives the Minister dictatorial power. I can only think that he has not read the Bill, or that he is imperfectly acquainted with the procedure by which a Minister makes regulations.

Dr. Waddington appears to use the word "strike" in reference to a possible refusal on the part of any doctor to participate in the scheme. This is a curious attitude of mind. If the Government in due time offers us a contract which we find unacceptable we have every right to decline to enter into that contract. This hardly savours of a "strike"—or is it so reprehensible in Socialist eyes to venture to differ from the Government that it constitutes one?—I am, etc.,

Hove. NORMAN MAPLE.

Universities and Outside Committees

SIR,—Serious misgivings have been felt and expressed regarding the position of the universities in relation to outside "Committees," so many of which have blithely made recommendations to Government Departments which have appointed them; and even when these recommendations seriously affect the educational autonomy of the Universities, they have been adopted by Government Departments without reference either to Parliament or the universities concerned. This tendency is criticized as obviously threatening academic freedom in the *Times Educational Supplement* (Sept. 21, 1946), both in the editorial and in an independent article. It is pointed out in the editorial that "the maintenance of academic freedom has today acquired a new significance," and the article presses the need for "a united front to preserve university independence."

London University has experienced an example of this new tendency to raise a report of a Departmental Committee practically to the level of a Cabinet edict. The Goodenough Committee, appointed by the then Minister of Health in March, 1942, and reporting in May, 1944, recommended (1) that the medical schools of the universities should adopt the principle of admitting a reasonable proportion of students of both sexes; (2) that the University should submit to drastic overhaul of the medical curriculum (to be conducted apparently by a body wholly outside university jurisdiction). The Minister of Health, Mr. Willink, announced (*Hansard*, Jan. 18, 1945) the decision of the Cabinet to enforce by manipulation of the Exchequer grants to universities these two recommendations of the Goodenough Committee. At no time, as far as I am able to ascertain, were the universities consulted before this decision was published.

The medical schools of London University have accepted, under protest, the recommendation imposing co-education. It has been pointed out by a highly responsible and authoritative medical corporation that the composition of the Goodenough Committee detracts from the respect which a committee wielding apparently such influence with the Government should command. The committee consisted of 10 members. There are 12 very famous medical schools of London University—only one of these schools (University College) was represented on this committee, and that school had three representatives. The second recommendation affecting the curriculum constituted, I submit, an even more revolutionary breach of academic freedom: the preparation and ordering of curricula have hitherto been regarded as the inalienable right and duty of university bodies.

The governing bodies of the teaching hospitals in London, all of whom are schools of the University, find themselves at present in an uncomfortably precarious position. The National Health Bill, which has passed its third reading in the House of Commons but is not yet law, makes a distinction between the teaching and the non-teaching voluntary hospitals as regards the independence of their management. The imperative necessity to secure the co-operation of the great teaching hospitals compelled the Minister (but with obvious reluctance) to leave a much larger measure of independence with the governing bodies of teaching hospitals as compared with the non-teaching hospitals. An illustration is offered of the predicament which the present uncertainty produces in the conduct of the teaching hospitals in the experience of the London School of Medicine for Women, with its parent hospital the Royal Free. The Goodenough Committee (see p. 119 of its report) pointed out that University College Hospital, the Middlesex Hospital, and the

Royal Free Hospital occupy an area which is over-hospitalized, and declared that "the removal of one of these medical schools to another part of London may become advisable," and that "the London School of Medicine for Women should be the school to move." The committee further declared that "University College Hospital Medical School is in the most favourable position of any medical school in London," a view with which the three representatives of that school on the committee were probably in hearty agreement. The Governors of the Royal Free Hospital, with the co-operation of the London School of Medicine for Women, desire to purchase an adjoining site now in the market in order to erect a new permanent wing of the hospital, whose buildings were seriously damaged in the blitz. The question of removal seems to have been broached to the governors of the hospital by the University Grants Committee in November last, when the governors made it quite clear that they were opposed to this suggestion, and since that date it would appear that the Ministry of Health have refused to sanction the carrying out of any projects for the purchase of sites adjoining the Royal Free Hospital; the Ministry would appear to rest this action upon the dictum of the Goodenough Committee, quoted above.

I submit, Sir, that this is a situation which calls for the anxious consideration of the medical profession, and perhaps might engage the attention of the new group of the B.M.A. which deals more particularly with political matters.—I am, etc.,

House of Commons. E. GRAHAM-LITTLE.

Royal College of Physicians of London

SIR,—Certain Members of the College have written to the medical journals about the representation of Members in the counsels of the College. They must know that the President took the initiative in calling a meeting of Members of the College in January. This was attended by three hundred Members and a committee was appointed to go into the matter. This committee reported to another meeting in April and their recommendations were accepted practically unanimously. The President thereupon brought the matter before the Council of the College, who made recommendations to the Comitia which involved alterations in the Bye-laws of the College, and this was put in hand at once. There is no reason to believe that the great majority of Members are not satisfied with the procedure adopted. A few Members criticized the method of election of Fellows but did not receive substantial support.—I am, etc.,

H. E. A. BOLDERO,
Registrar.

SIR,—If "Dum Spiro Spero" (Aug. 31, p. 313) finds his Membership of the College of Physicians a burden, he has a very simple remedy: he can resign it. When I had been a Member for 25 years I wondered why I had failed to be elected to the Fellowship, and looked up the Bye-laws. Bye-law LXXV reads as follows.

"The Council, in determining the fitness of Members for nomination to the College for election to the Fellowship, shall take into consideration, in accordance with the Bye-law: standing in the College, academical honours, distinction in literature or science, professional eminence, public appointments, and social position."

In regard to the first five of these, my claims, modest though they were, were in my admittedly prejudiced view at least not inferior to those of many youngsters who were received into the charmed circle after only five or six years' Membership. I therefore concluded that I was defective in "social position," whatever that might mean; that I was in some way "socially undesirable" as they say in totalitarian states.

In June, 1943, I notified the Registrar of my wish to resign my Membership. He replied that the President wished me to take no action until he (the President) had discussed the matter with me. In due course the President invited me to see him. After a long discussion he asked me not to resign before the next election. To this I agreed, and suggested that I should submit a list of my publications. This suggestion was ignored. When in the following May I was again not summoned to receive the coveted Presidential kiss or embrace, or whatever form the accolade may take, I applied for and was graciously given permission to resign.

When my resignation became known to my friends many of them told me that had they only been aware of the injustice which I had suffered they would have made representations on my behalf to members of the Council or other influential Fellows of their acquaintance. So numerous indeed were these kindly but belated offers that I was forced to conclude that "social position" was something acquired by the process of getting to know the right people. What surprises me is the seriousness with which my action is regarded by my friends. They tell me that I have "burnt my boats" and ruined my prospects of advancement, ignoring the fact that at my seniority I am beyond such considerations. My resignation has impaired neither my enjoyment of life nor my professional efficiency, such as it is. The College, beyond granting me a licence to practise (for which it was handsomely remunerated) six months earlier than I could have obtained it from my University, has not contributed one iota to my education. Its motto might well be *lucus a non lucendo*.

Having freed myself from the stigma of being a discredited Nestor among Members I have at least gained in self-respect. My only regret is the loss of £40 and the time and labour (wasted from an educational point of view) which I spent in cramming for the examination. If "Dum Spiro Spero" follows my example and ceases to indulge in the morbid luxury of giving way to his grief anonymously he will, I am sure, be a happier man.—I am, etc.,

Cambridge. FF. ROBERTS.

Postgraduate Education

SIR,—Prof. R. W. Johnstone's reproach (Oct. 5, p. 510) that in compiling the account of the facilities for postgraduate education in your Educational Number the Colossus of London was allowed to dominate the picture is due perhaps to the mistitling of the article. The article on "Facilities for Postgraduate Education" was almost wholly concerned with the work of the British Postgraduate Medical Federation, which has its centre in London, although, as Sir Francis Fraser stated, it should become a source of information on postgraduate facilities in all parts of the kingdom. But in other portions of the Educational Number, under the general heading of "Medical Schools," references were made to postgraduate facilities and facilities for taking higher qualifications, and here certainly, in the amount of information afforded, the universities outside London were in no way overshadowed.—I am, etc.,

THE COMPILER.

Definition of Health

SIR,—I should like to comment on the definition of health adopted by the World Health Organization, as reported by Dr. Melville D. MacKenzie (Sept. 21, p. 428). Surely complete physical, mental, and social well-being is a godlike state, which we, being human and mortal, can hardly hope to attain, let alone claim as our right. Besides, if health is to be so described, being a complete state, it cannot be otherwise than as it is. Thus, the following paragraphs of the Basic Principles would be absurd if it was not usually recognized that health is a variable state. To quote Dr. Walter P. Kennedy (*Lancet*, 1946, **2**, 427), ". . . . health is a state of being and, as a biological phenomenon, is in a continual condition of flux. . . . Health and disease are not a simple pair of contrasting opposites like heat and cold. They are made up of immense numbers of components involving the body, the mind, and the spirit. . . Health, then, is a state which can be measured."

I do not hope to influence the World Health Organization to change their definition, but I wish they had chosen the following: "Health is a balanced state of physical, mental, and social well-being, and not merely the absence of disease or infirmity."—I am, etc.,

London, W.C.1. W. F. FELTON.

Contamination of Bread

SIR,—Your annotation on rag flock (Sept. 28, p. 467) has these words in the last line: ". . . any kind of filling material . . ." It is about another and, I think, far more important filling material that I would beg to say a word or two. There are in my street more dogs and more children than in most streets; there are no gardens to the houses; the dogs and children share the roadway, footways, and gutters: the children prefer the roadway; the dogs have a preference for the footways, especially for depositing their excrement. At

the bottom of the street is a busy baker's shop to which bread is conveyed by motor-vans. This bread is transferred by means of large wooden trays from the motors to the shop, and it is quite a common happening for loaves to fall off the trays both outside and inside the shop. To save space I leave the rest to the imagination of the reader.

Now that there is more paper available, *vide* the enlarged news-sheets with their miles of printed piffle and advertisements, would it not be a matter for the attention of that "red"-hot health crusader, Mr. A. Bevan, to see that all bread is wrapped before being sent out from the factories? I have written to our local M.O.H. on this subject; but it may serve a useful purpose if you would give me the space to bring it to the notice of a larger public.

Our Dumb Friends League has a branch in our street, and I would expressly exonerate both the dogs and their keeper from all blame.—I am, etc.,

London, S.W.3. A. R. EATES.

Ex-Service Practitioners Committee

SIR,—In answer to the letters of Wing-Commander H. M. Stanley Turner and for the information of those medical men who are not aware of the fact, it should be known that at the meeting of Council held on June 5, 1946, it was decided to set up a special committee, now known as the Ex-Service Practitioners Committee. This Committee is composed of members appointed by the Council and after its first meeting decided to co-opt a number of recently demobilized practitioners.

The Committee has had under consideration the difficulties with which ex-Service practitioners are faced on their return to civil life and a number of recommendations have already been made to the Ministry of Health, particularly with regard to the returning specialists. A short statement on the recommendations made and the Ministry's comments will be published in the *Journal* at an early date.—I am, etc.,

P. MARTIN BRODIE,
Edinburgh. Chairman, Ex-Service Practitioners Committee.

Medico-Legal

EXPERIMENT ON CATS: APPEAL AGAINST FINES AT OXFORD

On June 25 Prof. E. G. T. Liddell, M.D., F.R.S., who holds the Waynflete Chair of Physiology in the University of Oxford, was summoned before the Oxford Magistrates' Court on a charge of causing unnecessary suffering to a number of cats by omitting to give them proper care and attention. He was fined £25 and ordered to pay 10 guineas costs, and Mrs. G. K. Scragg, keeper of the animal house, was fined £5 on a similar summons. The prosecution was instituted by the R.S.P.C.A. Prof. Liddell said he was conducting a group experiment on distemper in cats with the drug sulphamezathine. Prof. Harold Burrow, who holds the Chair of Medicine at the Royal Veterinary College, and Prof. A. D. Gardner, who holds the Chair of Bacteriology at Oxford, gave evidence to the effect that the cats could not have been caused serious pain.

Notice of appeal was given and the case came before the Recorder (Mr. John Foster, M.P.) at Oxford City Quarter Sessions on Oct. 7, 8, and 9. Mr. A. J. Long, K.C., for the appellants, said that there was no neglect on the part of Prof. Liddell bringing about suffering to the animals. He was carrying out a *bona fide* experiment on the group of cats to discover the effectiveness of treatment by sulphamezathine during an outbreak of distemper. Asked by the Recorder how he would describe the scientific object of the experiment, Prof. Liddell replied: the alleviation rather than the cure of cats' distemper. In the result the Recorder said he would allow the appeal of Mrs. Scragg, but he would dismiss the appeal by Prof. Liddell. None of the allegations was proved against Prof. Liddell except that of overcrowding, and therefore he would reduce the fine of £25 imposed by the City Magistrates to £5. The Recorder added that Prof. Liddell made an error of judgment in putting too many cats in a compound while they had distemper, but he performed no cruel experiment.

Obituary

Lieut.-Col. R. J. C. THOMPSON, C.M.G., D.S.O., M.D., M.R.C.P.

St. Thomas's men in all parts of the world, and those who served with or under him in the R.A.M.C., will regret to learn of the death of Lieut.-Col. R. J. C. Thompson on Oct. 2. It is only a short time since he retired from the post of Secretary of St. Thomas's Hospital Medical School.

Richard James Campbell Thompson, son of Richard Phillips Thompson of Stamford, Lincs., was born on Aug. 1, 1880, and was educated at Marlborough and St. Thomas's Hospital, qualifying in 1904 and serving as house-surgeon there before he joined the R.A.M.C. From 1910 to 1913 he was seconded to the Egyptian Army for work with the Sudan Sleeping Sickness Commission. He served throughout the 1914–18 war, was mentioned in dispatches, received the D.S.O. and was made a C.M.G. He commanded No. 36 C.C.S. during its time of greatest activity on the Somme and was later in command of No. 14 General Hospital at Wimereux. Soon after the end of the war he took the M.R.C.P.Lond. and the M.D. of Durham University, and worked as physician and surgeon to the Chelsea Royal Hospital. He retired from the R.A.M.C. in 1922. Then followed private practice at Bordighera, and he returned to England to take up the congenial post at St. Thomas's Medical School which brought him into touch with all members of the staff and with generations of students. He married a French lady in 1916; their only child was killed on active service with the R.A.F.V.R. in 1940.

G. F. P. writes: The account of the career of Dr. G. DOUGLAS GRAY in the *Journal* of Sept. 28 revived memories of an episode in the history of plague in which he took part. The International Conference held at Mukden in 1911 to study the origin and course of the epidemic of pneumonic plague which caused nearly 50,000 deaths during the winter of 1910–11 in Manchuria and Northern China was attended by well-known authorities, for example, R. P. Strong, Kitasato, Zabolotny, Martini, and Wu Lien Teh; Gray was a worthy representative of Britain. His wide knowledge of the local circumstances that were likely to influence the spread of the epidemic and his sound advice upon methods of prevention proved valuable in the discussions. Moreover, before the Conference was summoned, he co-operated with his Chinese colleagues in planning measures for combating the outbreak. He was obviously a man who had an impelling desire to prevent and relieve human suffering. A robust feeling of patriotism, though he never paraded it, animated and upheld him in all his undertakings. In the social hours of the Conference his pleasant humour, expressed with a trace of stammer and with a twinkle in his eye, made him a most attractive companion. I count myself fortunate in having been associated at that time in China with Dr. Dugald Christie, C.M.G., of Mukden, who also was a member of the Conference, Dr. Douglas Gray, of the British Legation in Peking, and Dr. G. E. Morrison, the eminent correspondent of the *Times*, all of whom were possessed by a love of China which was linked to an ardent love of their own country. Dr. Gray was the last survivor of this distinguished group.

The Minister of Health, Mr. Aneurin Bevan, speaking at the prizegiving ceremony of the Royal Dental Hospital, London, said: "The health of the nation has been improving steadily all along the line—except for its teeth. The condition of the teeth of the people of this country is deplorable. Partly this is due to lack of facilities for dental treatment, but the main reason is that people do not yet realize how important is the influence of the teeth on general health. At present only a small proportion of the population, perhaps one in ten, seeks regular dental treatment. As Minister of Health, I am bound to be seriously concerned about the other nine. When the National Health Service comes into operation, no one will be unable to obtain dental treatment through lack of means. Unfortunately the manpower situation in dentistry is very seriously short. Most dentists are over 45 years of age, and we need an increased entry of students up to 900 a year if the *Dentists Register* is to be kept at its present level. The premises of dental schools must be extended and the teaching staff increased. Dental surgery is one of the most important branches of preventive medicine."

Medical Notes in Parliament

HEALTH SERVICE BILL

SECOND READING IN THE HOUSE OF LORDS

The debate in the House of Lords which the Lord Chancellor opened on Oct. 8 (*Journal*, Oct. 12, p. 558) was continued by Lord MORAN.

On Oct. 9 the National Health Service Bill was read a second time without a Division and was committed to a committee of the whole House.

Lord MORAN said that everyone was convinced that a drastic reorganization of the hospital service was necessary. One-third of the 93,000 beds in the 1,059 voluntary hospitals in England and Wales were in institutions which had fewer than 100 beds—institutions hopelessly handicapped by their size when they attempted to act as general hospitals—and more than one-third of the 78,000 general beds in municipal hospitals were in public assistance institutions.

Reorganization meant a considerable expenditure of public funds and must entail some measure of public control. Control could only be exercised by the Minister or by the local authorities, and faced by a choice between these alternatives the profession preferred the control of the Minister. For a decade every professional discussion of the hospital service had been dominated by the dread that the hospitals would come under the control of the local authorities. It was the removal of that menace from the profession which had reconciled so many to the passing of the voluntary system and which had done more than anything else to make so many prefer the hospital provisions of the present Minister of Health to those of his predecessor.

A University Service

It was important that the hospital service should be a university service. That was the original conception underlying the establishment of the regions. The regions were originally suggested to bring in the universities. During the war all kinds of specialists were sent by the teaching hospitals into the important hospitals in the region. They attended these hospitals regularly, and they raised their standard almost to university standard. When they were called back at the end of the war there was a sharp fall in the efficiency of hospitals at the periphery. The university service could bring about a redistribution of specialists without duress.

The powers of the Regional Boards were vaguely defined in the Bill. If the inspectors worked independently of the Regional Board the Regional Board would lose authority. There was no guarantee that the Ministry of Health would not interfere in clinical matters. That was not a fictitious phantasy. It actually happened under the emergency medical service during the war.

Doctors feared that they would lose their independence. If that happened the profession would indeed have received a mortal blow. Whatever happened to the health services, however effective the reformation of it, it would avail nothing if the general conditions under which doctors worked did not bring contentment and happiness to them. In the innumerable discussions which the Bill had provoked the effect of the Bill on entry into the profession had hardly been mentioned. It was because the Minister treated the teaching hospitals so sympathetically, because he refused to blunt the growing edge of medicine, that, in the first instance, many doctors examined the provisions of the Bill with sympathy. But those who worked in the academic world in medicine were greatly perturbed at the present time about the powers and composition of the boards that would govern the teaching hospitals.

The well-being of the profession depended upon attracting the exceptional man. The fame of the voluntary hospitals had gone all over the world for one reason and for one reason only—namely, that the great advances of knowledge, which had been of incalculable benefit to the whole world, had come from workers within their walls. The physician at last had been armed, and in consequence there was an almost embarrassing rush to become a physician. At the present time the men of promise were entering for the examination for admission to the Royal College of Physicians at the rate of 1,400 candidates a year.

Spens Committee for Consultants

Lord Moran continued: "I gave notice to the noble Lord who introduced this debate that I should ask the Government to appoint a Committee on the lines of the Spens Committee, with laymen on that Committee, to go into the remuneration of consultants. I am glad to hear the Government consider such a proposal worth considering and that they will do it."

In the United States the public had been educated to believe that if a man's name was not "in the book" he was not a specialist. At the present time anybody could specialize in England without training, without special qualifications, without anything but assurance. The time was coming when we should have a list of consultants as in America—he hoped it would not come yet, because the general practitioner would then be cut off from the mild amount of specialization he at present undertook. The general practitioner must be brought into the work of the hospitals.

Medical Liberty

He was gravely disturbed by the general fears expressed by practitioners as to the future. They were against this abolition of the selling and buying of practices. They were against what they called a measure of direction, and they were against the basic salary; but these "againsts" all came down to one fear—the fear that there would be a whole-time medical service which would interfere with their liberty. "Will this whole-time service necessarily be good for the profession or the public? I do not think anyone knows the precise answer, but one thing I am certain of: unless there is an adequate incentive or incentives to keep men on their toes and to keep them keen throughout their working days, then a whole-time service would be an incalculable disaster. At the present time I am quite certain that the average doctor lives for his work. What we have got to ask is: will it be true in ten years' time? If I knew the answer to that question I should be able to tell you if the misgivings of the general practitioners are or are not true."

An unfortunate dispute at the eleventh hour had arisen between the Ministry of Health and the panel practitioners. Lord Moran was convinced that the claims of the panel practitioners were fair and just, but the dispute was not about terms but about procedure. The Minister wished to go into the remuneration of panel practitioners at the same time as the remuneration of men in this future service. The panel practitioners felt they had not a mandate for this discussion. He was perfectly certain that the Minister would meet their claims. It would be an absolute disaster if we began this service with a considerable section of practitioners disgruntled—men who felt that they had had a raw deal.

Lord Moran concluded by saying: "This is a measure designed for the betterment of the people in health and in happiness. It is not the product of one party but of parties over a number of years, and I believe that when it becomes law, in spite of all the differences there have been, the whole medical profession will unite to try to make it work."

Lord INMAN, who said he had been associated with hospital work for nearly thirty years, said that years ago hospitals were maintained entirely from voluntary sources, but such was not the case to-day. All sorts of weird appeals were organized to intrigue the public into giving. It was definitely wrong to depend on "stunt" appeals. He yielded to none his admiration of the work of the voluntary hospitals, and to those who said that they were to be killed under the Bill he would reply that the self-sacrificing spirit which had characterized their work would be allowed to continue. In these modern times the heavy cost of curative and preventive treatment and the building and equipment of hospitals meant legitimate financial demands which it was not within the power of voluntary effort to satisfy. The new Bill would continue and expand the work of the hospitals, building on their tradition and experience, to form a worthy edifice of which this country would be proud in years to come.

Evolution—Not Revolution

Lord HORDER said that for the last twenty years doctors had done their utmost to persuade the powers-that-be "to get a move on." But the doctors had hoped that it would be through the more natural process of evolution, rather than through the present method of revolution, that the Government would help them.

"More than once I have allowed that this Bill enhances one very desirable thing—that is, the availability of medicine to the citizen. But, as has been said by one of the speakers here this afternoon, we may pay too much for that advantage if it is gained in a way which does not take into account the possible sacrifices that are entailed. And you cannot stereotype medicine without a great deal of sacrifice. We believe that this Bill does risk stereotyping medicine, and whether we look at medicine from the point of view of the hospital services or from the point of view of the work of the individual doctor it must be a great loss to society if by the operation of this Bill medicine is stereotyped."

The ideal to be aimed at in framing a medical service policy for the nation was not this terrific centralization of power in

one man but a maximum of central direction and a minimum of central control. Closer contact with the medical profession during the framing of the Bill would have safeguarded the Minister, and his successors, under the Bill from the danger of over-centralization. When the Minister was criticized in another place for not discussing his proposals with organizations and bodies representing those who would be responsible for carrying them out he denied the imputation and spoke of consultations—that was his word—which were very wide.

Lord Horder continued: "The Minister uses the word 'consultation' in a very different sense from the one which we usually attach to that word. I was myself present at two of these so-called consultations. The form they took was as follows: The Minister told us what he proposed to do; he answered a few of our questions, and the conference concluded with his telling us that what he had said was to be kept secret. To this unilateral pledge all of us loyally adhered, to find ourselves quite soon tactically handicapped. We were hamstrung. The word 'consultation' was a euphemism for the most blatant form of *ipse dixit*-ism. It seemed to me at the time—and it still seems to me—a very unfortunate and a very unhelpful handling of this vital situation."

Remuneration of Doctors

They had been told that the remuneration of doctors would be in part by basic salary and in part by capitation fees, and that the capitation fees would scale down as the number of the doctor's patients under the national service increased. Now, by regulation, the percentage of remuneration by capitation fees might be reduced; it might ultimately disappear, at which point the doctor became a whole-time salaried Civil Servant. Was this good for medicine or for the community?

"I see no escape from this unthinkable state of affairs except through the medium of a black-market in doctoring, and my mind boggles at the thought of its probable immensity. And yet could we be other than sympathetic if we believe that it is the only salvation for the patient? The Minister tells us it is not possible to insert the terms of remuneration in the Bill. But it should be possible so to amend an existing clause that the method of payment is stated, and this method should be the capitation method unless, in the opinion of the Executive Council in whose area the services are rendered, a different basis is considered necessary."

The prohibition placed upon the buying and selling of a doctor's goodwill for his practice, the power of negative direction of doctors, and the refusal to allow a doctor charged with some offence under the Bill the right of appeal to the High Court were surely matters that required amendment. They seemed to be gross infringements of personal liberty.

Doctors thought that the Standing Advisory Committee of the Central Health Services Council should be appointed by, and take their references from, the Council, and that they should report through the Council to the Minister. The constitution of the local Executive Council should be safeguarded in respect of its medical, dental, and pharmaceutical representation. At present the Minister had power to vary the proportion of medical and lay representation.

Hospital Management Committees

In order to ensure more autonomy for hospitals and, therefore, in order to retain local interest in them, hospital management committees, acting for a group of hospitals, should appoint a house committee in each hospital of the group, subject to the hospital management committee and the Regional Board. It should be one of the functions of the hospital management committee or of the house committee to set up a medical staff committee, and such committee should have the right to nominate a reasonable number of its members to be members of the hospital management committee or house committee. On the question of medical education, the Bill needed amending, for at present it made no provision for the laying upon the boards of governors of teaching hospitals any duties in respect of furthering medical education and research.

There had been moments of impatience in which the Minister had forgotten that if he did not take the doctors, the hospital administrators, the dentists, the nurses, and the health workers with him the Bill could not succeed in its great purpose. Sometimes he remembered this, as he did only a few days ago when he said: "Now what we hope is to get the co-operation of the great medical profession and of all health workers in the country, because without that co-operation this scheme is bound to fail. The House of Commons only passes Bills; it is the men and women outside who can make them living realities." This was surely the beginning of wisdom. The Minister had courage, enthusiasm, a nimble mind, and a conscientious belief that these proposals were in the best interests of the community. "I think that the Minister will go far, but in what direction I am not able to say. I find the prognosis in that respect extremely difficult."

Finally, Lord Horder said it was quite obvious that we were about to embark upon a great experiment in the nation's medical services. It was the doctor's duty to do his utmost to make the experiment succeed. But there was for the doctor an over-ruling duty—his duty to his patients. If he could fulfil this paramount duty through these means he would, but if he could not it would be for the patient to decide how long the sacrifice of efficiency should continue.

The Local Authorities

When the debate was resumed on Oct. 9 Lord Listowel replied to some of the points made on the previous day. He said Lord Munster had complained that the Bill weakened the spirit of local patriotism and of voluntary service by transferring the hospital service from the local authorities to the State. But public-spirited persons who had served on local authorities would not be deterred by the change. In the past many counties and county boroughs had done little to develop a hospital service. The large local authorities which ran the general hospitals would be no worse off than they were in 1928. Under the Bill these larger local authorities acquired a range of obligations and permissive powers in health services which they had never hitherto had to discharge. The Bill did not propose that the Ministry of Health should run the hospitals. Clause 11 said that the Minister must—not may—delegate his powers to regional hospital boards and from there to hospital management committees, or in the case of teaching hospitals to boards of governors. Each hospital committee would be free to decide how its money should be spent within the limits of an annual budget. Hospital committees and boards of governors would be as independent in their day-to-day arrangements for running the hospitals as the committees that ran them now.

In delimiting the regions to be administered by regional boards the Minister must consult the interested parties before making up his mind. He would then define the regions under regulations, and if a noble lord disapproved of one of these regulations he could move its rejection in the House. It was not, and never had been, the policy of the Government to institute a full-time salaried medical service which would wreck the whole health scheme from the outset. The Government desired a system of remuneration based partly on capitation fees and partly upon a basic salary. At the same time he deprecated the suggestion that full-time employment of doctors in public service led to inefficiency or neglect of patients. The professional standards of medical officers of health or of other doctors employed in hospitals run by local authorities, as also of doctors employed in the Armed Forces, were as high as those of doctors in private practice. Hospital endowments in memory of an individual would still be used for the benefit of the sick, and when an allocation was made from the hospital endowments fund to any particular hospital the wishes of donors would not be forgotten.

Health centres under the Bill would be experimental, and in view of other demands on the building industry it was impossible to wait until every health centre could be newly built.

Domestic Affairs of Hospitals

Lord Moran had asked whether the Ministry or the regional board would investigate hospital complaints and engage or dismiss nursing staff. Both these powers would be delegated to the regions, and there was no real danger of Whitehall interfering in the domestic affairs of hospitals. Lord Moran had mentioned the difference of opinion between the Ministry and the panel practitioners. A meeting between Mr. Bevan and the representatives of the profession would take place on Oct. 10.

The spirit of voluntary service must be retained in the hospitals. Lord Horder had said his ideal for the medical service was the maximum of central direction and the minimum of central control. That was what the Government aimed at under the Bill. Lord Horder's fear of a dead level of mediocrity in the medical profession would prove to be groundless. There would continue to be a graduated scale in the salaries in the hospital service and progressive remunerations for general practitioners. The good man would have every incentive to get on in medicine. The Bill as it emerged from Parliament would only be the skeleton of a national health service. The Service would need the genuine good will and co-operation of those engaged in medicine, and also of public authorities and voluntary agencies. No less essential would be an intelligent and responsive attitude to its own health in the mass of the population.

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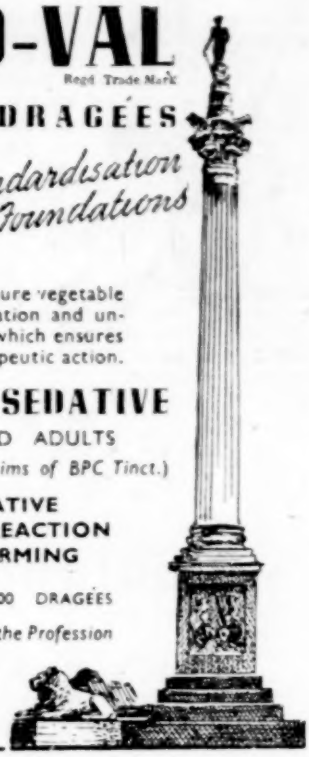

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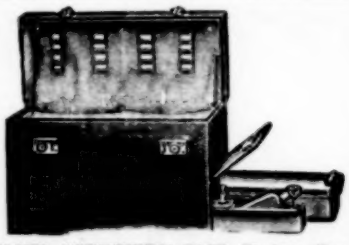

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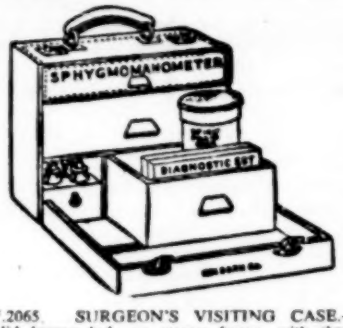

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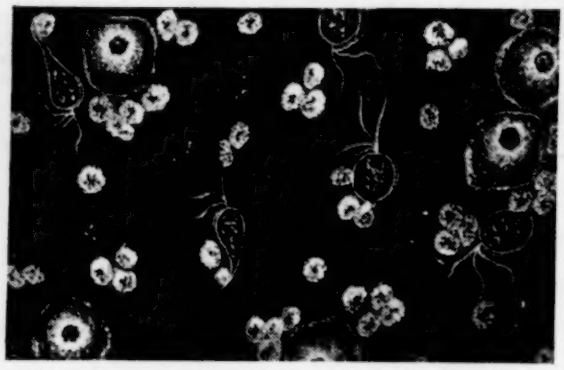

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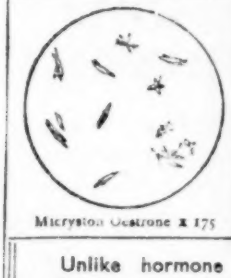

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consideration. When the time came for action it was to be hoped that differences would be forgotten and that the ranks of medicine would be closed to implement the plan. Such an attitude of mind was a patriotic duty. The debate so far had shown a foundation of agreement about the main principles on which the Bill was based. It was not the product of any single party or Government.

The advocacy of a wider and more comprehensive medical service had become more prominent in the B.M.A. during the war, and many doctors then began to press for drastic improvements in what they deemed to be the present inadequate system. The imagination of the public was then gripped by the social security proposals in the Beveridge report. Thereafter the ideas in the Bill had come from varied sources. If the Bill moved in the direction of State medicine it combined freedom for doctors and patients with over-all planning, private and public practice, and unpaid voluntary service with salaried contractual obligations. It was as far from the State system of medicine practised in Russia as it was from the commercial medicine favoured by the United States of America.

Criticism of Bill

Lord LYLE said the Bill was another step on the slippery road leading to nationalization. The promise by Mr. Lloyd George of "ninepence for fourpence" was a small exaggeration compared with the promise of a free health service which in fact was going to cost approximately £150,000,000 a year. In dealing with the position of the doctors, their patients, and the voluntary hospitals this was a thoroughly bad Bill. The outlook for patients under the Bill was gloomy. They would have no satisfactory way of airing their complaints. There would have been no loss had Mr. Bevan allowed existing endowments of hospitals to be preserved so that the wishes of the departed donors could have been respected.

Economic Barrier Removed

Lord BEVERIDGE said he gave whole-hearted support to the Bill in practically all its main features, though it was not intended to do everything that was wanted to promote the health of the people of this country. Health depended on housing, nutrition, sanitation, and so on. The Bill removed completely the economic barrier between sick persons and the best possible treatment. It set up for the first time a true Minister of Health. He hoped that meant that the Ministry was going to be a continual irritant to authorities who were not getting on sufficiently with housing, sanitation, and nutrition.

He did not think that the question of private practice would be very important. He could not imagine any large part of the people continuing to pay for such service when they were entitled to get as good a one without paying for it at all. The regional hospital boards were an improvement on the joint authorities. He was not sure that the executive councils would sufficiently represent the ordinary citizen. At one time the opinion of doctors was in favour of getting health centres. He hoped this was still so. He asked whether there was any means of compelling a local authority to set up a health centre.

His experience as a university teacher was that it was possible to receive the whole of one's income as a salary while retaining freedom, initiative, and a sense of being in the service of the people with whom one dealt. Through the Grants Committee the universities received public funds without public control. He hoped a system of that sort could be applied to the medical services, and above all to the teaching hospitals. The main difference between university teaching and the medical profession was that the medical profession had to work harder at less regular hours, and its job was not so pleasant; it should therefore be paid better than university teaching. The plan of a relatively small salary with capitation fees seemed a good device. The doctor ought to be able to choose to work harder to get more income.

He hoped the medical profession would take from the university teaching profession the practice of refresher courses. Under the new system a doctor would have the chance of six months or a year at a time to rub up his subject. The spirit in which the Bill would be administered could be judged by the spirit in which the Government would approach the amendment which would be moved in the House of Lords. In some matters the Bill was too rigid.

Subscriptions to Hospitals

Lord LUKE said the battle for nationalization had been won and lost in the House of Commons. He thought that the greater tidiness which might result under the present scheme would be at the cost of greater efficiency and more personal service. The Hospital Endowments Fund created by the Government was a big pill to swallow. At the moment people hesitated in making subscriptions, and that was bound to continue in view of Mr. Bevan's assurance that hospitals in financial difficulties might appeal to him for assistance. Lord Luke understood that they would not appeal in vain. It was difficult to balance this with the maintenance of an incentive to people to give money to hospitals. How could Mr. Bevan expect to get large subscriptions in the future if he continued to insult the large contributors? He hoped that a formula could be evolved for the interim period which would prevent people's generous habits being broken.

In regard to the non-teaching hospitals, he asked whether it was possible for management committees to manage their hospitals efficiently if they did not have control of the staff. That control had been vested in the regional boards, and there was no provision in the Bill to give effect to the assurance of the Government that there would be no interference by the regional boards with the management committees. The net annual expenditure of the new hospital service would be about £95,000,000. Did that figure include the additional beds which were needed to provide adequate accommodation? He understood these additional beds would number about 90,000. For these the cost would be £135,000,000. He estimated that the country needed 7.6 beds per 1,000 of the population. This on the 1941 census was equivalent to 315,000 beds. The existing provision was 225,000 beds. When would the extra beds be available and how were the hospitals to arrange staff for the additional accommodation? The public had been led to expect something far and away better than the present system. He would do all he could to ensure co-operation, to forget past differences, and to improve what was good.

Lord DONOUGHMORE said it was obvious that voluntary contributors could not face the enormous increase that would be necessary in financing the hospitals of the country. The voluntary hospital had not been called so solely because it was supported by voluntary contributions. On its board men representing all the professions gave their services to the sick for nothing. Unless the medical profession found it possible to support this Bill heart and soul it was bound to fail. The medical profession was altering every day, and he hoped it would not have too much direction in detailed matters of administration. He hoped they would soon be told how many regions there were going to be and what were their functions. In London he had been concerned this summer with negotiations for co-operation between four large hospitals. These hospitals would like to co-operate but did not know which regions they were going to be in.

Dismay of Local Authorities

Lord ADDINGTON said people must come before plans and administrative machinery. Love, care, and consideration could not be exercised if there was friction between the doctors and the Government or between the doctors and the patients, nor would the aims of the Bill be fulfilled if the doctor was not free to follow his own conscience. He hoped the House of Lords would be able to make considerable improvements in the scheme. Some of these were desired by the borough councils of England for which he spoke. Non-county boroughs viewed with dismay the loss of their maternity, child-welfare, and other health services, and so did the county councils the transfer of their hospitals to the Minister. The people had come to look to these local authorities for their needs in public health. The borough councils would like provision to be made to enable a county council to delegate some or all of its public health functions to its non-county boroughs. Local health authorities should be able to nominate their representatives upon the regional hospital boards, management committees, and boards of governors of the teaching hospitals, and should have representation upon the Central Council.

With regard to the voluntary hospitals, he believed those who lived in these areas would find it detrimental always to be treated thirty or fifty miles away. They would prefer to be treated in the small hospitals in their own towns and by their own doctors. They also wanted to be visited by their families and friends. This was particularly the case with chronic invalids. Some of these chronic cases might be given a few of the beds in small hospitals in their own towns. These hospitals should be continued, and there should be a house committee for each of them. In the last week of September the B.M.A. had inaugurated a World Medical Association, with representatives of 31 different nations. The aim was to assist all the peoples of the world to a higher level of health. That had been welcomed by Mr. Bevan, who pointed out that there was in medicine a concern for the individual and that the primary concern of doctors was that the thing necessary should be done. If the Government showed greater care for the health of the people than for political advantage or for preconceived plans the doctors would show they cared much more for the health of the common folk than for financial advantage and some of their professional traditions.

Direction of Doctors

Lord LLEWELLIN said he approached the Bill solely from the point of view of the patient. From the patients' point of view the time had come for a better health service. In his view the Bill did not in the right and best possible way take steps to improve the hospital services and the health services generally. The majority of doctors disliked being controlled. There was no need whatever to buy the doctors out of their practices. The problem of attracting doctors to the under-doctored parts of the country was comparatively small, and it could have been met on the lines of the scheme for the Highlands and Islands of Scotland, which by special inducement secured doctors to serve in those parts. That could have been worked for a far less cost. The new entrants who looked round for a safe job with a regular salary were not the men who rose to the top of their profession. He fancied that in the main the new men who would come into the State medical service would not be the active, progressive men who should be engaged in a great science such as medicine. As a patient, he said: "When we are short of doctors do not let us do anything to drive some of them away. Let us do everything to get the best recruits into the medical profession." Under the Bill the Minister could be questioned in either House of Parliament on anything which happened in any hospital. That was a frightfully hampering thing. If mistakes were made in the hospital an instruction would go cut to all regional boards and hospitals that nobody was to do things in that way in the future. Staffs would be tied up by quantities of forms to fill in and quantities of instructions to read. Those for whom he spoke were not going to divide against the second reading of the Bill.

Closure of Debate

The LORD CHANCELLOR closed the debate. Many of the points made were committee points, and he promised that the amendments moved would receive careful consideration, though great care had been taken in preparing the Bill and Mr. Bevan had made considerable concessions. The House would not suppose that the Government assented to any particular amendment. The Labour Party had no doctrine against charity, but they objected to services of essential importance being left to the mercy of charity instead of being provided out of public funds. Essential services to-day were so much more costly than thirty years ago that the State had to come in.

He was sorry some statements had been made which might lead doctors to suppose that the Government was going to nationalize medicine or that the doctors were going to be enslaved. If the Government were to propose a scheme whereby the doctors would become salaried Civil Servants they would not come in. The Government had no such intention. The fear of interference with the doctor should not be encouraged by responsible members of the House of Lords. Mr. Bevan only wished to pay a minor part of the doctors' remuneration in the form of salary. Payment of salaries to university professors and judges did not enslave them. If it was enslaving doctors to say that the new entrants to the Service after the appointed day must get the consent of the Medical Practitioners Committee when taking up public practice, that was precisely the proposal of the Coalition Government. When there was a partnership of three doctors of whom one died and the others wished to get a new man, then the most relevant fact considered by the panel would be: "Here is the man the other two want." In 99 cases out of 100 the man who was wanted would get his way.

On the selling of public practices he thought that in a country practice where patients had no choice of doctors a man indulging in public practice who sold it was virtually selling his patients. If two men came after the practice one of whom was less suitable but was prepared to pay a larger sum, what was the reaction of the vendor? For that reason the Government thought that the selling of a practice by a man who was getting his remuneration in part from public funds was no longer right. He underlined what had been said about the necessity for decentralization. This scheme would fail unless the Minister decentralized on the largest possible scale. The Government believed that the transfer of functions from minor to major local authorities was essential, because in that way alone could the present confusion be removed. The treatment of endowments had its precedent in an Act passed by the last Government, whereby, by Order in Council, endowments given to schools for particular purposes could be taken away and used for different purposes without the consent of the trustees. Under the Bill endowments, after passing to the Minister, had to be reallocated by regulation. The Minister would consider whether a particular bequest was for some local purpose. He renewed his assurance that in Committee the Government would look carefully at all amendments and see whether any of them could be accepted as improving the Bill.

The Bill was then read a second time.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation on Oct. 1 Mr. H. Thirkill, Master of Clare College, resigned office as Vice-Chancellor, and was re-elected for a further year. In his address to the Senate he made the following reference to the expansion of medical education which the University has had under consideration for some time:

"In general, it was considered that the first step in this expansion should be the establishment of a School of Postgraduate Teaching and Clinical Research composed of Departments in special branches of medicine, which could be in close touch with the established University Departments of Science. A beginning has been made with the creation of a Department of Experimental Medicine and a Department of Radiotherapeutics. In these and other Departments which have been contemplated, and are likely to be established later, there will be opportunities for postgraduate training as well as unrivalled facilities for research. The implementation of this plan has called for the closest co-operation with Addenbrooke's Hospital. It is expected that an important step towards the fusion of the interests common to the University and to Addenbrooke's Hospital will be taken during the year by the University Departments of Pathology and Biochemistry becoming responsible for the pathological and biochemical services of the hospital. This should be of mutual benefit. For the hospital, there will be available the resources and expert knowledge to be found in a University department. For the University, there will be the large field of study and research provided by the evidence accessible at the hospital, while the other specialist University Departments, already created or contemplated, will have a complete University organization in the basic sciences of pathology and biochemistry to which problems can be referred for advice, assistance, or solution. The whole trend of this policy is in keeping with the general recommendations of the Report of the Interdepartmental Committee on Medical Schools, which are designed to make the University the focus of medical education and research for what will eventually be the East Anglian Region. It is felt, too, that the special Departments will have an attraction for postgraduate students and research workers far beyond the local region, extending to the Dominions and Colonies. At the same time, the need for educating general practitioners in modern medicine has been appreciated. The honorary staff of Addenbrooke's Hospital have, during the past year, given a number of postgraduate courses in general medicine to returned ex-Service medical men. The experience gained from these courses will be of great value in framing suitable courses of instruction for general practitioners in civil practice. The question of the organization of the School of Postgraduate Teaching and Clinical Research is under active consideration by the University and hospital authorities concerned, and a report will shortly be presented to the University."

During the months of August and September titles of the degrees of M.B., B.Chir. were conferred by diploma on the following members of Girton or Newnham Colleges: R. S. J. Baker, Mrs. H. F. Barnes, K. A. C. Bowen, J. E. G. Brieger, F. M. Fountain, J. F. Grant, Mrs. M. C. Hare, M. Hobson, P. A. Howard, E. G. Howe, G. M. Hunt, H. M. J. Lawn, B. M. Leach, Mrs. J. Raymond, A. M. Sibly.

G. R. E. Naylor, M.B., B.Chir., demonstrator in pathology, has been elected into an official Fellowship at Gonville and Caius College.

The names of candidates for the M.Chir. examination should be sent to the Registrary by Dec. 31. The examination begins on Feb. 18.

UNIVERSITY OF LONDON

Ian Aird, Ch.M., F.R.C.S., has been appointed to the University Chair of Surgery tenable at the British Postgraduate Medical School; Miss Dorothy Russell, M.D., Sc.D., to the University Chair of Morbid Anatomy, and Clifford Wilson, D.M., to the University Chair of Medicine, both tenable at the London Hospital Medical College. J. L. D'Silva, D.Sc., M.B., has been appointed to the University Readership in Physiology tenable at St. Bartholomew's Hospital Medical College, and J. M. Robson, M.D., D.Sc., to the University Readership in Pharmacology tenable at Guy's Hospital Medical School.

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The Gillson Scholarship in Pathology of the annual value of £105 is open to candidates under 35 years of age who are licentiates or freemen of the Society, or become so within six months. Regulations may be obtained from the Registrar, Society of Apothecaries, Black Friars Lane, E.C.4.

Welfare work in Greece, a children's hospital in Yugoslavia, and day nurseries in Great Britain are among the subjects discussed in the September number of *The World's Children* (20, Gordon Square, London, W.C.1, price 6d.).

No. 39

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Sept. 28.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

***Figures of Births and Deaths, and of Deaths recorded under each infectious disease are for:* (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.**

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1946					1945 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	32	6	19	1	2	17	1	20	—	1
Deaths		—	2				—	1		
Diphtheria	285	15	79	26	14	486	37	133	63	15
Deaths	7	—	1	—	—	6	2	—	2	—
Dysentery	66	6	40	1	—	264	52	99	1	1
Deaths				—	—				—	—
Encephalitis lethargica, acute	2	—	1	—	—	—	—	1	—	—
Deaths		—					—			
Erysipelas			39	9	1			34	10	5
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				57					110	
Deaths	47	3	5	6	3	75	6	25	17	4
Measles*	1,461	69	79	29	6	406	35	83	25	4
Deaths	1	—	1	—	—	—	—	1	—	—
Ophthalmia neonatorum	67	3	18	1	—	66	6	10	—	—
Deaths										
Paratyphoid fever	19	1	7 (B)	—	—	11	1	1 (B)	—	—
Deaths	1	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	373	13	4	3	—	302	13	5	2	6
Deaths (from influenza)†	5	2	1	—	—	8	—	1	—	—
Pneumonia, primary			118	35				146	12	
Deaths		18		3	8		11		6	4
Polio-encephalitis, acute	—	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	30	3	3	6	1	40	5	1	7	2
Deaths		—					—			
Puerperal fever		—	6		—		5	15		—
Deaths										
Puerperal pyrexia‡	164	13	17	—	2	124	12	14	2	—
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,001	65	168	36	35	1,509	113	272	27	42
Deaths	1	—	—	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	12	1	1	3	1	15	—	1	4	—
Deaths	1	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,451	81	78	39	28	920	39	44	16	6
Deaths	8	1	—	—	1	5	1	—	—	—
Deaths (0–1 year)	355	42	56	19	24	343	37	67	34	14
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	4,187	615	573	183	121	3,761	558	510	163	93
Annual death rate (per 1,000 persons living)			12·6	11·7				11·6	10·5	
Live births	9,545	1414	1081	505	243	6,530	835	818	454	239
Annual rate per 1,000 persons living			21·7	32·4				16·4	29·3	
Stillbirths	275	29	46			203	19	27		
Rate per 1,000 total births (including stillborn)			41					32		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

EPIDEMIOLOGICAL NOTES

Outbreak of Ringworm

The county medical officer of health for West Lothian states that the outbreak of ringworm of the scalp in the Bathgate area involves 160–170 cases. A clinic has been improvised at one of the Bathgate schools and the cases, most of which arose during the summer vacation, will be dealt with by *x*-ray epilation. Routine measures of isolation and instruction about prevention are already tending to check the outbreak.

Discussion of Table

In *England and Wales* a decline was reported in the incidence of whooping-cough 159, while an increase was recorded for measles 253, scarlet fever 148, and diphtheria 45.

The notifications of whooping-cough have decreased for six consecutive weeks. A small decrease was reported from most regions and the largest local falls were Lancashire 37 and London 19.

The only variations of note in the incidence of scarlet fever were increases in Yorkshire West Riding 35 and Durham 20. A rise was recorded in the notifications of measles following a continuous decline for the last eleven weeks. The incidence tended to increase in most regions with the exception of London and the South-East, where a fall of 74 occurred; the largest rises were Devonshire 110, Northumberland 70, and Yorkshire West Riding 44.

Diphtheria was generally slightly more prevalent during the week. The largest rises were Lancashire 23 and Warwickshire 11. The total number of cases of dysentery in the country was unchanged; the largest local variation was an increase of 15 in Middlesex (Southall M.B. 10).

In *Scotland* a rise in incidence was reported for dysentery 18, measles 18, and scarlet fever 10, while a fall of 27 was recorded for whooping-cough. The largest local increase in cases of dysentery was at Edinburgh, where the notifications increased from 3 to 14.

In *Eire* a rise of 20 in the cases of scarlet fever was due to a general rise in incidence. The increase in whooping-cough was mainly due to the experience of Dublin C.B., where the cases rose from 15 to 32. The incidence of diarrhoea and enteritis remained practically unchanged; 49 of the cases were notified from Dublin C.B.

In *Northern Ireland* only small changes in the totals of infectious diseases were reported.

Quarterly Returns for England and Wales

The Registrar-General's returns for the June quarter record a birth rate of 19.2 per 1,000, the highest rate in any quarter since that of June, 1925. The infant mortality was 41 per 1,000 live births, being 9 below the average of the ten preceding second quarters. The death rate was 10.7 per 1,000, which was 0.3 above the rate for June, 1945, but 0.9 below the average death rate for the five preceding June quarters.

Infectious Diseases in the Third Quarter

Notifications of infectious diseases during the September quarter of this year showed considerable changes in the general trend of diphtheria, dysentery, and the enteric fevers.

The notifications of diphtheria have been at the lowest level recorded. For each of the thirteen weeks of the third quarter the total has been below the 346 cases which was the lowest level reached in 1945. Cases of diphtheria in this quarter are only two-thirds of the number in the corresponding period in 1945 and approximately a quarter of the number occurring ten years ago. Diphtheria notifications in the third quarters of the past ten years, 1937–46, were: 13,395; 13,639; 10,632; 11,387; 10,631; 9,517; 7,951; 6,133; 5,437; 3,473.

The incidence of dysentery, which rose continuously throughout the war, has fallen rapidly during the third quarter and the total for the quarter is only 27% of that for the same period of 1945, though still almost twice the pre-war level. The notifications for the third quarters of the ten years 1937–46 were: 532, 430, 464, 613, 1,320, 1,718, 2,501, 3,509, 3,396, 923.

The enteric fevers (typhoid and paratyphoid) reached a high level of incidence during the third quarter. The totals for the September quarter of the ten years 1937–46 were: 603, 401, 636, 1,427, 2,876, 261, 240, 245, 255, 723. The high value in 1941 was due to an outbreak of paratyphoid which originated from cream cakes in a multiple bakery in the Liverpool area. The rise this year was mainly due to typhoid contracted by eating ice-cream in Aberystwyth M.B. The sanitary control of ice-cream is the subject of an annotation at page 584.

The Health of Edinburgh

The report of the medical officer of health for 1945 records a birth rate of 15.4 per 1,000, a decrease of 1.2 on the 1944 rate. Infant mortality was 50 per 1,000 births, the lowest rate ever recorded. The infant mortality rate in Edinburgh has been below the rate for the other three large cities since 1920; the corresponding figures for these cities in 1945 were Glasgow 68, Dundee 57, and Aberdeen 54. The general death rate was 14.4 per 1,000 and was 0.6 below the average for the preceding five years. There were 218 deaths attributed to pulmonary tuberculosis, the lowest death rate from this disease on record, but the number of new or suspected sufferers from this disease was the largest ever dealt with by the Department of Health.

Week Ending October 5

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,079, whooping-cough 1,311, diphtheria 319, measles 1,781, acute pneumonia 411, cerebrospinal fever 32, dysentery 63, acute poliomyelitis 23, paratyphoid 20, typhoid 11.

Medical News

Dr. J. Calvert Spence will deliver the Charles West Lecture on Tuesday, Nov. 19, at 5 p.m., at the Royal College of Physicians of London. Subject: "The Care of Children in Hospital."

The next meeting of the Middlesex County Medical Society will be held at Hillingdon County Hospital, Hillingdon, Middlesex, at 2.30 p.m. to-day (Saturday, Oct. 19).

Dr. G. Roche Lynch will deliver a lecture entitled "Medico-Legal Experiences" before the Hull and District Branch of the Royal Institute of Chemistry at the Guildhall, Hull, on Wednesday, Oct. 23, at 7.30 p.m. At Dr. Roche Lynch's request the secretary cordially invites members of the medical profession to attend this lecture.

At a meeting of the Medico-Legal Society at 26, Portland Place, W., on Thursday, Oct. 24, at 8.15 p.m., a paper will be read by L. Le M. Minty, Ph.D., on Legal Aid to Assisted Persons.

At a meeting of the Medical Society for the Study of Venereal Diseases at 11, Chandos Street, W., on Sat., Oct. 26, at 2.30 p.m. Dr. F. R. Curtis will give an address on Venereal Disease in Occupied Germany.

Dr. Neville Lloyd, M.R.C.P., has been appointed chief medical officer, Ministry of Supply, with effect from Sept. 23, 1946. Dr. Katharine Williams, M.R.C.P., who has held the locum tenens appointment as C.M.O., has now taken up duty as principal medical officer, Atomic Energy Research Establishment, Harwell, to which she was appointed on June 11, 1946.

At a scientific reunion of the Société Internationale de Chirurgie Orthopédique et de Traumatologie held in Brussels on Oct. 3 and 4, Prof. Louis Ombrèdanne was re-elected as president, and Dr. Jean Delchef as secretary-general of the Society. Prof. Harry Platt and Dr. San Ricart (Barcelona) were elected vice-presidents. Dr. Henry Meyerding, of the Mayo Clinic, was elected as president of the next congress, which will be held in Amsterdam in September, 1948.

The first number of a little weekly periodical, *Science To-day*, is dated Oct. 10, 1946. The editor is Mr. A. W. Haslett, M.A., who until recently was Public Relations Officer of the B.M.A. It is published from 104, Clifton Hill, London, N.W.8, and the subscription rate is 30s. a year.

At the 125th anniversary of the founding of McGill University, Montreal, honorary degrees were conferred on Sir Hector Hetherington, Principal and Vice-Chancellor of the University of Glasgow, and on Dr. Thomas F. Cotton, F.R.C.P., physician to the National Heart Hospital, London, who graduated at McGill University in 1909.

The Dean of Westminster Hospital Medical School, presenting his report for the year on Oct. 7, referred to the amalgamation with the Infants Hospital, Vincent Square, and with All Saints' Hospital for Genito-urinary Disease. The first professorial chair in the School has been created—that of clinical pathology. A pre-war association with the Army Medical College, Millbank, has been resumed, and postgraduate instruction is being given to a number of officers. London University is to make a grant of £25,000 to the School in the coming year.

The Unionist Committees of the four Scottish Universities have unanimously decided to adopt the Right Hon. Walter Elliot, F.R.C.P., F.R.S., as their candidate in the Parliamentary by-election caused by the resignation of Sir John Boyd Orr. Col. Elliot represented the Kelvingrove Division of Glasgow for 21 years until defeated at the General Election. He was Minister of Agriculture, 1932–6, Secretary for Scotland, 1936–8, and Minister of Health, 1938–40.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to The Editor, British Medical Journal, B.M.A. House, Tavistock Square, London, W.C.1. Telephone: Euston 2111. Telegrams: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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B.M.A. Scottish Office: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Heliotherapy in Pulmonary Tuberculosis

Q.—*Is heliotherapy harmful or not in pulmonary tuberculosis?*

A.—In 1932, Fishberg (*Pulmonary Tuberculosis*, 4th edition, Kimpton, London) remarked that hardly any writer had advanced a sound reason for the use of heliotherapy in pulmonary tuberculosis. Nothing has been recorded since that time which justifies any alteration of this opinion. Gosse and Erwin (*British Medical Journal*, 1934, **2**, 15) have shown that the onset or exacerbation of symptoms in cases of pulmonary tuberculosis often follows sunbathing, and there is considerable evidence that heavy exposure to sunlight can produce a focal reaction around an exudative lung lesion. In a recent review of the whole subject, Mayer (*Radiation and Climatic Therapy of Chronic Pulmonary Disease*, Williams and Wilkins, Baltimore, 1944) concludes that there is no clinical evidence to prove the value of light radiation in uncomplicated pulmonary tuberculosis, while there is considerable evidence that it can be harmful.

Malaria Prophylaxis

Q.—*Can you recommend a non-toxic prophylactic, other than quinine, against malaria?*

A.—Mepacrine 0.1 g. daily by mouth acts as an efficient suppressive agent against malaria. Most persons find it relatively non-toxic although it has the disadvantage of staining the skin yellowish. Paludrine, a colourless compound, in a dose of 0.1 g. twice weekly, or chloroquine in a single dose of 0.3 g. weekly, appear even superior to mepacrine in their suppressive actions, but they are not yet ordinarily available, although it is expected that paludrine will be readily obtainable within a few months.

Premature Baldness

Q.—*I have been asked by a mother if I can do anything to prevent her son, now aged 3, from going bald at the age of 18. Her father and two brothers went bald at that age.*

A.—It is a little early to condemn a male infant to premature baldness. For the true masculine type of baldness not much can be done; but when, as often happens, this is associated with seborrhoea of the scalp (dandruff) beginning in late adolescence the active treatment of the seborrhoeic component by sulphur pomades or a resorcin lotion, with regular shampooing, usually delays the more complete forms of baldness for many years. The answer, therefore, is the early treatment of any scalp seborrhoea should this be present or develop.

Right and Left Systolic Blood Pressures

Q.—*In many cases of hypertension the systolic pressure in the left arm is higher than that of the right arm. Why should this difference be found and which reading is the correct one?*

A.—As a rule the blood pressures in the arms are approximately equal and rather lower than the pressures in the legs. It is not uncommon for a disparity to exist between the systolic pressures in the arms. Provided the difference does not exceed

20 mm. of mercury it may be disregarded unless there are other reasons for expecting inequality. In subjects free from cardiovascular disease neither side is more likely than the other to have the higher pressure. A reduction in the blood supply to the limb will result in diminution of the pulse and lowering of systolic and diastolic pressures in it. Lesions of the aorta obstructing the mouths of the great vessels, advanced peripheral arterial disease, pressure on the artery from without, and atrophy of a limb are the most likely causes. Whenever there is a difference between the blood pressure measurements in the arms the higher should be taken as more nearly corresponding to the power of the left ventricle (systolic) and to the general peripheral resistance (diastolic).

Penicillin for Chronic Otitis Media

Q.—*Would it be advisable to use penicillin in the form of drops in a child with chronic otitis media?*

A.—Penicillin could not be expected to have more than a temporary effect at best in a chronic infection of this kind. Penicillin given in drops would not reach the antrum.

Air Travel and Pregnancy

Q.—*A seven-months pregnant woman is obliged to travel by air. Is there a risk of premature labour? If so, would progesterone be of prophylactic value?*

A.—Unless there is reason to believe that this woman is in some way predisposed to abortion and premature labour the risk of interruption of the pregnancy is probably little greater than if she did not undertake the iourney. The widespread belief that travelling in itself increases the incidence of abortion and premature labour appears to be insecurely founded and has not been substantiated by controlled observations. A recent investigation reported by A. W. Diddle (*Amer. J. Obstet. Gynaec.*, 1944, **48**, 354) showed that rough travelling did not increase the abortion rate in a series of pregnant women. The real reason for advising a pregnant woman against undertaking long journeys is not that premature labour is more likely but because she might be in difficult circumstances if it did occur.

If a pregnancy is complicated by some condition predisposing to its premature termination the position is probably different. Travelling, or indeed any minor physical or emotional upset, might then be sufficient to precipitate the onset of expulsive uterine contractions. In the case mentioned, if the pregnancy is normal there is little point in administering progesterone, although it could do no harm and might give the patient more confidence.

T.A.B. Inoculation of Infants

Q.—*A patient returning to Rhodesia with her daughter, aged five months, is anxious for the infant to be protected with T.A.B. vaccine. Is this necessary?*

A.—Typhoid and paratyphoid infections are rarely encountered in young infants. Provided the feeding can be controlled and sterilization ensured it would not appear to be necessary to inoculate this infant.

Silicosis and Bronchitis in "Saw-doctors"

Q.—*Is the diagnosis of silicosis likely to be correct in the case of a bronchitic saw-doctor with finger-clubbing and doubtful x-ray findings?*

A.—No. Grinding band-saws on a rapidly revolving carborundum (silicon carbide) disk will not cause silicosis. Therefore if this has always been the man's occupation he could not have acquired this disease. Gardner (*Amer. Rev. Tuberc.*, 1923, 7, 344) proves in a classic experiment that finely divided powder of carborundum failed to produce silicosis despite the sharp-edged nature of its particles. It was following these observations that the "solubility theory" of silicosis developed. On the other hand the grinding of iron may cause a fine dust of this metal, which is opaque to *x*-rays, and long-continued inhalation may give the appearance of reticulation in the *x*-ray. This, however, would not be associated with symptoms or with fibrosis in the lungs.

INCOME TAX

Addition to Partnership

R. A. inquires whether, in the case of an additional partner entering a firm, "it is usual for the old partnership to be wound up and the accounts closed, or do the old partnership accounts continue?" He also asks how this question affects the liability of the new partner.

*** Whether the old accounts be closed or not is a matter of arrangement between the partners. It is difficult to say what is the "usual" course, but where the old firm has been assessed to income on a "cash receipts" basis, the tendency is to avoid closing the old accounts, as that would involve changing the basis of assessment over to "gross earnings." R. A. will be assessable not as an individual but as a member of the firm, and will have to bear tax on his share of the firm's assessment. His interest in this question is therefore the same as the interest of the other members of the firm.

Depreciation of Car

N. P. sold his car (on which the standard wear and tear allowance had been claimed and given in past years) in March, 1946. A depreciation allowance has been refused for 1946–7.

*** That is correct. Under the Income Tax Act, 1945, depreciation allowance is to be calculated on the value of the "plant and machinery" as at the end of the "basic year." Presumably in N. P.'s case the basic year did not end until after the car was sold, and consequently there was no value on which to calculate the allowance for 1946–7.

LETTERS, NOTES, ETC.

The "Silver Ring"

The honorary secretary of the Family Planning Association writes from 69, Eccleston Square, S.W.1: The medical committee of this society feels that a warning should be given to practitioners concerning the sudden revival of popularity of a method of contraception called the "silver" or "Grafenberg" ring. This appliance consists of a small spiral or other type of ring composed of silver, platinum, or some other suitable metal, which is inserted into the uterine cavity, where its presence, provided it is retained, is intended to prevent the embedding of the fertilized ovum. The advantages of such an unexacting method of contraception are so manifest that the device was fairly widely studied some fifteen years ago, both here and on the Continent. Unfortunately, the risks involved in its use have proved greater than were at first anticipated. In addition to the fact that even in cases where the ring is retained the failure rate is high (5% at least; the ring often being born with the baby) the incidence of pain, menorrhagia, and metrorrhagia have been considerable, and subacute infections, acute salpingitis, etc., have been caused in healthy nulliparous women. Moreover, the device entails the utmost danger to women who have previously had, or who contract, gonorrhoea. One such case was reported which necessitated subsequent hysterectomy. Within the last few months, this device has achieved an alarming popularity, for certain practitioners claim it to be the method of choice, even for young nulliparous brides. Members of this committee have met with many cases of infective lesions occurring in such patients, which they will be happy to publish if it appears necessary. It is very difficult for the medical practitioner to obtain guidance on such a matter, and, without it, he is at a great disadvantage when his patients claim to have had friends who have been highly delighted with the method. In point of fact, no progress has recently been made in improving the essentials of the ordinary contraceptive technique: viz, for security, either some type of occlusive rubber cap must be used by the wife in conjunction with a chemical spermicide; or a sheath, preferably with a spermicide, must be used by the husband. Such methods are non-injurious, and offer a high percentage of safety (98% at least used over 10 fertile years), provided they are competently chosen and applied.

Severe Pre-eclamptic Toxaemia with Separation of Retina

Dr. JAMES A. WATERMAN writes from Trinidad: A 38-year-old married woman was admitted to the Colonial Hospital, Port of Spain, on May 16, 1945. With her first pregnancy twelve years previously the patient had suffered from toxaemia; child living. The present history was that she was seven months pregnant, and had had no antenatal care. She complained of generalized swelling of the body for three weeks and total blindness for seven days; bronchitis for two weeks. Examination on admission revealed numerous rhonchi in the lungs, and nothing abnormal in the heart. The urine was solid with albumin, and the pus present was very

offensive. Blood urea 0.033%. Blood pressure 230/150. An ophthalmoscopic examination by Mr. V. M. Metivier gave the following result: "Retinitis of pregnancy marked, papilloedema very marked in both eyes; retinal detachment in lower quadrant of right eye; extensive retinal detachment of left eye, several patches of exudate and a few haemorrhages; condition indicates profound toxaemia of pregnancy." The patient refused immediate operation. She became delirious on May 21, aborted on May 23, and died on the 25th.

Effects of Penicillin Lozenges

Mr. W. E. Thompson (Huddersfield) writes: Your correspondent, answering a question on the incidence of complications following oral penicillin treatment (Sept. 21, p. 447), concludes that the occurrence of stomatitis and glossitis from this cause is a rarity since only four cases have so far been reported. In the few months which have elapsed since penicillin became readily available to the public outside hospital this troublesome complication has necessitated suspension of treatment in three of my own cases and has been observed by some of my medical colleagues to whom I mentioned the cases in conversation. The patients were (1) an adult male with severe acute tonsillitis, (2) a young woman with chronic pharyngitis and subacute rheumatism, and (3) a middle-aged woman with aphthous buccal ulceration associated with early pregnancy. In all three the glossitis was very striking, and in the second case the degree of exfoliation was so marked as to cause the patient's relatives some alarm. Different batches of penicillin lozenges were employed for all three cases. None has been noted so far in children who in the main have received this form of local penicillin therapy more than adults. Judging by the complete absence of any such manifestation in a wide use of penicillin parenterally in hospital, often in massive dosage, it seems improbable that the responsible agent can be anything other than some impurity in the lozenges. Some direct evidence would, however, be welcome as to its nature and mode of action. These few remarks seem justified by the epithet "rare" applied by your correspondent to a complication which almost every doctor must now have seen. The inference is that the *rara avis* is not the clinical case but the medical practitioner who, under the harassing conditions imposed by modern panel practice, can find either the time or the inclination to record and ventilate his personal observations.

Dr. T. V. Cooper (Dorchester) writes: The implication of the answer (Sept. 21, p. 447), under the above heading, is that glossitis and stomatitis following the use of penicillin lozenges are very rare, but my experience would lead me to believe that the figure of 18% mentioned in the question is very near the truth. It is certainly the case that the incidence is high among one's fellow practitioners and nursing staff using this form of therapy, but I believe that this is merely due to the fact that these patients are more observant and more constantly observed. In the *British Medical Journal*, 1946, **1**, 924, under the heading "Reports of Societies. Medical Uses of Penicillin," Sir Alexander Fleming commented that: "Penicillin lozenges were useful, but in certain patients produced an unpleasant stomatitis. Here again, while the streptococci disappeared from the mouth, their place was taken by penicillin-insensitive organisms, which might be worse for some patients than the streptococci." My limited observations have failed to confirm this explanation, and it is my belief that the source of the trouble lies in the lozenge base both by virtue of its mechanically irritating properties and the fact that there is sugar present, which is likely to irritate by its osmotic effect. During the war, in conjunction with some American colleagues who were in the district, I made some penicillin lozenges with a gelatine base, and about thirty cases, so far as I know, which were treated with these, showed no complication. Thirty cases is a small number, but I feel convinced that if thirty cases were treated with the *B.P.* lozenge and carefully observed some instances of glossitis would probably be found. I have observed complications so frequently that I hesitate to recommend the use of the present commercial lozenge until either the base is altered or some other reason for the glossitis is conclusively found.

Dr. W. T. S. McKean (Belfast) writes: In view of your statement in "Any Questions" (Sept. 21, p. 447) that only four cases of glossitis following treatment with penicillin lozenges have so far been reported I feel that I should put on record my own experience. Recently a rather active period in a long history of chronic tonsillitis prompted me to try penicillin lozenges. I consumed thirty-four lozenges in three days and then I stopped because my tongue was distinctly painful. During the next seven days the hard palate and then the angles of the mouth were involved, and it was only after ten days that I was able to smoke and drink normally hot fluids with comfort. Although the condition is unpleasant for the patient it can hardly be considered by the doctor as serious, and I feel that for this reason the incidence of glossitis and stomatitis is probably greater than the cases so far reported would indicate.

Medical Journals Wanted

Dr. Donald Paterson of 27, Devonshire Place, Wimpole Street, London, W.1, informs us that the medical library of the University of Manitoba has during the war been unable to obtain, or has lost, copies of the following journals:

British Heart Journal, 1939, **1**, No. 3 (July); 1942, **4**, No. 3 (July), (both out of print). B.M.A., Tavistock Square, London, W.C.1.

British Journal of Experimental Pathology, 1937, **18**, No. 3 (June); 1935, **16**, Nos. 1 (Feb.), 2 (Apr.); 1942, **23**, No. 3 (June). H. K. Lewis & Co., Ltd., 136, Gower Street, London, W.C.1.

British Journal of Urology, 1942, **14**, No. 2 (June). John Wright & Sons, Ltd., 28, Orchard Street, Bristol, 1.

British Medical Bulletin, 1943, **1**, Nos. 1, 2, 4 (out of print). 3, Hanover Street, London, W.1.

Glasgow Medical Journal, 1941, **18**, No. 4 (Oct.), (out of print). Alex. MacDougall, 104, West George Street, Glasgow, C.2.

Irish Journal of the Medical Sciences, 1945, No. 8 (Aug.). Cahill & Co., Ltd., Parkgate Printing Works, Dublin, Ireland. London: 1, Furnival Street, E.C.4.

Guy's Hospital Reports, 1939, **89**, No. 2 (Apr.); 1942, **91**, No. 2 (Apr.), (both out of print). Guy's Hospital, London, S.E.1.

Journal of Laryngology and Otology, 1941, **56**, No. 3 (Mar.), (out of print); 1945, **60**, Nos. 1–5 (Jan.–May). Headley Bros., 109, Kingsway, London, W.C.2.

Lancet, 1945, **2**, No. 14 (Oct. 6). 7, Adam Street, Adelphi, London, W.C.2.

Nature, 1927, **119**, No. 14 (Apr. 2), (out of print); **120**, No. 26 (Dec. 24), No. 27 (Dec. 31), (out of print); 1944, **153**, No. 5 (Jan. 29), No. 6 (Feb. 5), No. 9 (Feb. 26), (out of print); 1945, **156**, No. 1 (July 7), (out of print). Macmillan & Co., Ltd., St. Martin's Street, London, W.C.2.

Royal Army Medical Corps Journal, 1944, **83**, Nos. 3–5 (Sept.–Nov.), (out of print). Staples Press, Ltd., 83–91, Great Titchfield Street, London, W.1.

If any reader has a spare copy of any of these journals Dr. Paterson would be grateful if they could be forwarded to him so that he can help to fill the gaps in the medical library of the University of Manitoba.

Obsolete Addresses

Dr. L. Millard (Swynnerton) writes: May I, through your columns, make an appeal to manufacturers of drugs, instruments, etc., to check up through the *Medical Directory* the addresses of those to whom they wish to send advertisements and samples? A conscientious butler spends time almost every day readdressing and posting correspondence of this nature sent to an address which I vacated at least five years ago, and I would like to relieve him of this self-imposed task.

Production of Medical Equipment

Dr. D. R. Macdonald (Edinburgh) writes: Can nothing be done to speed up the production of medical apparatus? For example, it is at present impossible to purchase an ordinary diagnostic set or a Hamblin's ophthalmoscope without having to wait for about six months. I would suggest: (1) that manufacturers be given first priority for the materials which they require; (2) that export of this essential type of commodity be stopped; (3) that surplus Service stocks be at once placed on the second-hand market.

Penicillin in H. influenzae Meningitis: Correction

In a leading article on this subject (Oct. 5, p. 498) an important reference was omitted. The authors to whom credit is due for first observing that meningitic strains of *H. influenzae* are sensitive to penicillin were R. Forgacs, R. Irene Hutchinson, and R. E. Rewell (*Lancet*, June 23, 1945, p. 785). They treated two cases of this disease: one died only twelve hours after admission, but the other recovered following combined treatment with penicillin and sulphadiazine. Both strains of *H. influenzae* "were sensitive to penicillin to about the same degree as the standard Oxford strain of staphylococcus." Subsequent detailed studies of more numerous strains have shown that the concentration required to inhibit their growth is usually between 0.5 and 2.0 units per ml. and intrathecal injection is required in order to maintain this concentration. Reference is again made to this subject in our leading article at p. 581 of this issue.

Corrections

We regret that in the *Journal* of Oct. 12 (p. 555 and in table of contents) Dr. C. E. S. Flemming's name was mis-spelt. There was also an error on p. 529 in the spelling of the full name of William Thomas Green Morton.

Bart's men will regret to hear that Sister Theatres is retiring. It is intended to show gratitude for many kindnesses by a small present. Donations may be sent to the Senior Resident Anaesthetist, St. Bartholomew's Hospital, E.C.1.